

University of Cape Town

**AN ENVIRONMENTAL EVALUATION PROCEDURE FOR  
COASTAL TOWNSHIP AND RESORT DEVELOPMENT  
PROPOSALS IN SOUTH AFRICA**

by

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A dissertation submitted for the degree of Doctor of Philosophy  
in the Department of Environmental and Geographical Science  
at the University of Cape Town.

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## ABSTRACT

Most coastal nations recognise the environmental, economic and educational value of their coastal zones. Consequently, they have developed integrated management programmes and employ a variety of strategies, in particular, Environmental Impact Assessment, to promote the sustainable use and development of these resource-rich areas.

In South Africa, the absence of a formal, holistic and systematic procedure for evaluating proposals that affect the coastal environment is identified as one of the main causes of coastal degradation. The Integrated Environmental Management Procedure, developed in 1992, provides a generic framework within which the planning and evaluation of proposals, significantly affecting the environment can be made. Further development of more detailed procedures, practical guidelines and tools for specific activities or in particular environments, is now urgently required.

The central aim of this dissertation is to develop an environmental evaluation procedure for coastal township and resort development proposals, consistent with the principles of Integrated Environmental Management, and appropriate to the conditions in a developing country, such as South Africa.

The proposed procedure addresses key weaknesses inherent in most Environmental Impact Assessment systems in developing countries and incorporates and builds upon relevant Coastal Zone Management strategies operative in South Africa. Furthermore, it seeks to unpack and clarify the Environmental Impact Assessment concept by identifying its underlying principles, clarifying procedural requirements and making operational the processes which characterise it. To assist with implementation, a variety of tools and a series of practical guidelines, have been developed.

The key features of the procedure were derived from an extensive literature review, an examination of the environmental evaluation and coastal management systems

operating in South Africa, a questionnaire survey amongst coastal managers, and from case study material. Action research informed ideas for making operational the processes of scoping and public participation.

Particular attention was given to identifying and developing appropriate methods and guidelines for identifying impacts, determining impact significance, involving the public, assessing recreational carrying capacity, clarifying trade-offs amongst alternatives, marrying expert opinion and local experiential knowledge and incorporating subjective value judgements into the assessment and decision-making processes.

It is submitted that the employment of this procedure to all proposals affecting the coastal zone and the establishment of the proposed institutional mechanisms for its implementation, will streamline and enhance existing coastal management efforts and give direction to the further development and implementation of an Integrated Coastal Zone Management programme for South Africa.

## PREFACE

This dissertation is presented as a series of six papers which have either been published, or are in the final stages of publication, followed by six guideline documents. An overall introduction outlines the linkages between each paper and the logical progression of ideas as the dissertation develops. In the conclusions, the key findings and proposals emanating from the various papers are highlighted. A consolidated reference list, which includes all references cited in the various papers and sections comprising this dissertation, is presented at the end.

The status of publication of the various papers presented in this dissertation is given below.

Sowman, M. A review of EIA as a management strategy in coastal zone management programmes. Paper submitted to *Coastal Management*.

Sowman, M. 1993. The status of coastal zone management in South Africa. *Coastal Management*. 21: 163-184.

Sowman, M., Fuggle, R. and Preston, G. (In press). A review of the evolution of environmental evaluation procedures in South Africa. *Environmental Impact Assessment Review*.

Sowman, M. (In press). Improving the practice of public participation in environmental planning and decision-making in South Africa. *Town and Regional Planning*.

Sowman, M. and Gawith, M. (In press). Participation of disadvantaged communities in project planning and decision-making. *Development Southern Africa*.

Sowman, M. Environmental Evaluation Procedure for Coastal Township and Resort Development Proposals. Paper submitted to *Ocean and Shoreline Management*.

Whilst two of the papers are co-authored, the research for and preparation of all the manuscripts was undertaken by myself. The co-authorship of Prof. R. Fuggle and Dr. G. Preston in Paper 3 is in recognition of their contribution to the development of the Integrated Environmental Management Procedure, which is outlined in a section of this paper. The three authors were senior members of a research team, charged with developing an environmental impact assessment system, termed Integrated Environmental Management, appropriate to circumstances in South Africa. The co-authorship of Ms. M. Gawith in Paper 5 is in recognition of her assistance in the research activities undertaken in the informal settlement research project in Hout Bay.

The reasons for presenting the dissertation in the format outlined above, are twofold. Firstly, at the time when I began writing the dissertation, the University of Cape Town encouraged Ph D candidates to present their work ready for publication. Secondly, by making peer-reviewed information accessible to the broader community, it is in keeping with a key principle underpinning the research approach adopted and advocated throughout this dissertation; namely, that a transparent and participatory approach is followed.

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# INTRODUCTION

## NATURE OF THE PROBLEM

South Africa's coastal zone, as in many other coastal nations, is under severe and increasing development pressure. Economic development activities including clearing land for agriculture, commercial and industrial undertakings, provision of infrastructural services, and in particular, increased residential and recreational developments, are transforming, and in places irreversibly degrading, the coastal environment (Heydorn and Tinley 1980; Siegfried 1985; Council for the Environment 1989a and 1991; Sowman 1991; Henderson 1992; Kapp Prestedge and Retief 1992).

Much of the coastal degradation which occurred in the past can be associated with the activities of the more affluent sectors of South African society. The absence of legislative provisions and administrative procedures which require that environmental and social costs of development proposals be evaluated prior to decision-making, are probably the key causes for the inappropriate allocation and development of coastal resources and areas. More recently, factors such as high population growth rates (Simkins 1991) and depressed economic conditions (Ramphela 1991; Kapp Prestedge and Retief 1992) are resulting in exploitative and environmentally inappropriate approaches to resource use and development.

Whilst these latter trends are common in many developing countries, the political changes occurring in South Africa are having far-reaching implications for coastal resource and area management. Necessary actions to redress the imbalances of Apartheid include the provision of basic needs, the restoration of historic land rights as well as the removal of restrictive legislation. These measures are placing enormous strain on coastal systems and existing facilities. Of particular concern to this study, is the increasing demand for residential accommodation and recreational

facilities in coastal areas by both the affluent and historically marginalised sectors of society. Apartheid policies have meant that access to coastal activities has not kept pace with population requirements. The result is that the provision and expansion of coastal facilities is now urgently required.

Demand for property adjacent to estuaries, lagoons and sheltered bays is especially high, because of the aesthetic qualities and diversity of recreational opportunities afforded by these sheltered and productive systems. It is these environmentally sensitive areas that are most vulnerable to ad hoc, unco-ordinated planning and development. Potential climate change, and in particular sea-level rise, may further exacerbate management problems. Added to this, water abstraction from rivers and wetland areas increases the management problems for sensitive low-lying coastal and estuarine systems.

Up until recently, increased use and development of the coastal zone has proceeded with little consideration of the environmental and social effects of such actions (Heydorn and Tinley 1980; Retief and Bosman 1984; Stauth 1983; Council for the Environment 1989a and 1991; Sowman 1991; Henderson 1992; Heydorn et al. 1992). This unrestrained and exploitative approach to development is largely due to the failure of traditional market mechanisms to recognise the true value of environmental assets, the absence of integrated coastal zone management policies and inadequate procedures for evaluating the environmental implications of development applications affecting the coastal zone.

Worldwide, most coastal nations have recognised the environmental (including social, cultural and spiritual), economic and educational value of their coastal areas. Many have formulated integrated policies and developed co-ordinated management programmes to promote the sustainable use and development of these resource-rich areas (Burbridge et al. 1989; Sorensen and McCreary 1990; CAMPNET 1991; Clark 1991; Organisation for Economic Co-operation and Development 1993).

The overall goal of most Coastal Zone Management-type (CZM) programmes is to promote the conservation and sustainable, multiple use of coastal resources and areas. Various sub-goals and more specific objectives may be defined depending on the issues motivating the formulation of the programme, its focus, the political context and institutional arrangements within which the programme evolved. In order to achieve these goals and objectives, a variety of management strategies have been employed to implement these programmes (Healy and Zinn 1985; Brandani and Schnack 1987; Sorensen and McCreary 1990; CAMPNET 1991).

Environmental Impact Assessment (EIA), as a procedure for identifying, assessing and communicating the environmental consequences of a proposal is recognised as an integral management strategy of any CZM effort (Clark 1989; Sorensen and McCreary 1990; Sorensen and West 1992). In fact, EIA is considered by certain CZM theorists to be a minimum requirement for such programmes (Clark 1989).

Whilst the application of EIA to proposals affecting the coastal zone is common practice in many coastal nations, its effectiveness in furthering the goals of CZM is limited. This is largely due to shortcomings inherent in EIA as a management tool and various problems associated with its application. These include:

- procedural and methodological inadequacies within the EIA process itself (Lee 1982; Hollick 1986; Wathern 1988; Thompson 1990; Lee and Colley, 1990; Lee and Walsh, 1992);
- the practice of undertaking EIA as a separate activity from the planning process (Whitacker 1984; Lim 1985; Wood 1988; Armour 1990; Brown 1990; Fuggle 1990; McDonald and Brown 1990; Sorensen and West 1992);
- undertaking project specific EIA's in the absence of broader policies, programmes and plans which have themselves been subject to environmental evaluation (Westman 1985; Rees 1988; Sorensen and West 1992), and
- the direct transference of complex, quantitative and time-consuming methodologies to developing countries (Biswas and Geping 1987; Ahmad and Sammy 1987).

- Weaknesses in the application of EIA including lack of political will, inadequacies in the institutional arrangements for implementing EIA, shortage of appropriately trained personnel, as well as limited resources, technical competence and data.

Other key constraints to EIA's effectiveness, especially in developing countries, can be attributed to political styles and attitudes, institutional inadequacies and limited resources, expertise and data.

Whilst considerable progress has been made in the area of CZM in South Africa (Coetzee and Geldenhuys 1989; Retief et al. 1991; Heydorn et al. 1992; Sowman 1993), the use of EIA as a management strategy to achieve the objectives of CZM is limited. This has been largely due to the absence of integrated CZM policies and supporting legislation which requires that environmental evaluations be undertaken for activities significantly affecting the coastal environment. However, as recently as June 1992, the Department of Environment Affairs (DEA) published a document outlining a generic procedure for integrating environmental considerations into the planning and decision making process (DEA 1992).

This evaluation procedure, termed Integrated Environmental Management (IEM) provides an overall framework within which the environmental consequences of policies, programmes, plans and projects may be identified, assessed and communicated to decision makers (Fuggle et al. 1992; Sowman et al. in press). The development of specific evaluation procedures and tools such as guidelines, criteria and technical advice notes, for specific activities (such as roads and resorts) or in particular environments (such as the coastal zone and wetlands) within the overall IEM framework, is now considered to be desirable and practicable (Fuggle et al. 1992). However, for an environmental evaluation procedure to be of practical value in a developing country such as South Africa, it would need to be appropriate to the political, socio-economic and institutional conditions of the country and implementable in terms of available expertise, resources and capacity.

The central concern of this dissertation is development of a coastal environmental evaluation procedure (CEEP) which is consistent with the principles of IEM, and can contribute to more effective management of coastal areas. The challenge is to develop a procedure which can satisfy the following requirements:

- is appropriate to the political, socio-economic and institutional conditions of the country;
- adopts a holistic, systematic and multi-disciplinary approach in order to address the complex and dynamic processes and interactions occurring in the land-sea interface zone;
- is broadly acceptable in terms of its underlying principles, processes and philosophical approach;
- is rational, systematic and methodologically sound and addresses the key weaknesses limiting the effectiveness of EIA's in developing countries;
- enhances and is consistent with the goals and objectives of CZM efforts, and
- is practical to implement in terms of available expertise, resources and capacity.

## AIMS AND OBJECTIVES OF THE DISSERTATION

The overall aim of this study is:

**to develop an environmental evaluation procedure for coastal township and resort development proposals appropriate to the conditions in a developing country such as South Africa.**

The principal objectives are:

1. to review and assess the use and effectiveness of EIA as a management strategy in CZM-type programmes with a view to addressing and developing areas of weakness, thus improving its practical application to proposals affecting the South African coastal zone;

2. to assess the status of CZM in South Africa, paying particular attention to the strategies employed to achieve the conservation and sustainable use of coastal resources, identify obstacles to achieving effective CZM and recommend action to improve efforts;
3. to review the evolution, philosophical underpinnings and current status of environmental evaluation in South Africa in order to inform the development of detailed evaluation procedures for coastal proposals;
4. to examine the concept and practice of public participation in the EIA process and explore ways of broadening its scope and making it more operational, and
5. based on the above, to develop an environmental evaluation procedure for proposals affecting the coastal zone, which provides a structural framework for undertaking the tasks of EIA, gives guidance on the processes by which these tasks may be accomplished, and provides tools and guidelines, to assist with implementing these tasks.

## APPROACH FOLLOWED TO DEVELOP THE PROCEDURE

In order to develop an environmental evaluation procedure which was theoretically sound; consistent with the principles and procedures of IEM; broadly acceptable; practical to implement in terms of institutional conditions, available expertise, resources and capacity, and was cost-effective, a variety of issues relevant to EIA and CZM needed to be reviewed and investigated. A number of questions guided this review and investigation process and provided the information and insights required to develop the procedure.

The following key questions were addressed in the course of this study:

At an international level:

1. What are the key characteristics of, current trends in and future directions of EIA and CZM?

2. How well is EIA performing in achieving the goals set for it? What are the key areas of weakness in the EIA process and what factors inhibit its effective implementation?
3. To what extent, and to what effect, are formalised EIA procedures being currently employed as a strategy to enhance coastal zone management efforts?

At a regional level:

4. What is the status of CZM in South Africa and how well is it performing in terms of the requirements of Integrated Coastal Zone Management (ICZM)? What action is required to improve CZM efforts in South Africa?
5. Is EIA being used as an instrument of environmental management, and more specifically coastal zone management, policy development and practices in South Africa? If so, what are the guiding principles and characteristic features of the South African EIA system?
6. To what extent, and how, are the public, including disadvantaged and illiterate communities, involved in the environmental planning, assessment and review process?
7. How can public participation be made operational in the environmental planning, assessment and decision-making process?
8. What should the characteristic features, and processes of a coastal evaluation procedure be to ensure that environmental issues and community concerns are better integrated in all aspects of coastal planning, environmental assessment, decision-making and development?
9. What simple and cost-effective methods can be employed and what tools should be developed to assist with the tasks of the evaluation procedure?
10. What institutional mechanisms should be created to implement the CEEP?

In general terms much of the information required to answer these questions was obtained from an extensive review of the literature. This included published material, as well as unpublished material such as reports, manuals, legislation and guidelines. Insights gained from personal involvement in EIA studies, undertaking case studies

and in depth investigations on specific issues, such as recreational pressure on coastal areas, provided a better understanding of the issues and problem areas requiring attention. In particular, experience gained from facilitating the public participation process of several EIA's in South Africa as well as action research amongst disadvantaged coastal communities, informed the responses to questions 6 and 7 and helped develop ideas for making operational the processes of scoping and public participation.

Two fundamental principles advocated in the proposed coastal evaluation procedure are the involvement of the public and relevant authorities throughout the process, and the marrying of expert opinion and local experiential knowledge and values in reaching decisions. The insights and knowledge of experts, relevant authorities and the public were therefore sought throughout the development of the procedure. For example, mail questionnaire surveys were administered amongst coastal resource managers in both developed and developing countries to provide first hand practical information relevant to questions 1-3. In particular, the design and development of the CEEP, whilst largely based upon information generated in addressing questions 1 to 7, also involved several discussions with developers, planners, environmental professionals, non-governmental organisations, as well as those involved in research and management of the coastal zone, in order to obtain their input regarding the practical implementation of the proposed evaluation procedure.

The findings and key issues emerging from the reviews and investigations undertaken, from action research, case study material as well as discussions held with a wide range of people, are presented in a series of six papers and six guideline documents which constitute the body of this dissertation. The overall approach and specific methods employed to undertake the research required to answer the various questions are outlined in the individual papers.

## SCOPE AND LIMITATIONS OF THE STUDY

The complexity of human interactions, conflicting resource demands and interests in the coastal environment, necessitated an holistic and multi-disciplinary approach to the study. Adopting such an holistic and multi-disciplinary approach required the author to review and become conversant with a number of subjects and schools of thought, in particular the fields of CZM, EIA, environmental planning and public participation. Given the extensive literature in all these fields it was not possible to become entirely proficient in all these areas.

For several reasons the study spanned a period of eight years, during which time profound changes occurred in the fields of CZM and EIA, as well as in the socio-political arena of South Africa. The development of the evaluation procedure for coastal development proposals began in early 1987, and a draft document outlining the proposed procedure was produced for comment at the end of 1987 (Sowman 1987). Thereafter, a workshop was held with developers, planning professionals, environmental scientists, resource managers, non-governmental organisations and decision-making authorities involved in coastal zone matters to assess its adequacy, and feasibility for practical implementation. Following on these workshops, further investigations were undertaken, and the procedure was modified and certain areas further developed (Sowman 1990).

However, during this time, the Council for the Environment, a statutory body responsible for advising the Minister of Environment Affairs, commissioned consultants to undertake research to develop a generic approach for ensuring the integration of environmental considerations into the planning, assessment and decision-making process of all proposals affecting the environment (Council for the Environment 1989b). In 1991, a second research study was initiated to further develop and refine the proposals outlined in the 1989 document, appropriate to the socio-political circumstances and institutional conditions in South Africa. In finalising the principles, procedures and guidelines of this generic evaluation procedure, extensive consultations were held with all parties interested in, or affected by, environmental management. The author was a member of the research team which

developed the Integrated Environmental Management (IEM) procedure, and prepared a series of guidelines for its implementation (Department of Environmental Affairs 1992).

In the field of CZM, various initiatives have been undertaken to provide the basis for a policy framework for CZM in South Africa, including the publication of *Principles and Objectives for CZM* and *Guidelines for Coastal Land-use* (Council for the Environment 1989a and 1991 respectively). In order to ensure the broad acceptance and practical implementation of the evaluation procedure being developed for coastal township and resort proposals, it had thus to be consistent with the principles and procedures of IEM and the initial policy documents guiding CZM efforts in South Africa. The challenge was to build on the strengths of these initiatives, address shortcomings and so advance the thinking and practical application of EIA as an effective strategy of CZM.

A key objective of this dissertation is to provide guidance in the form of guidelines for the practical implementation of the CEEP. However, it was considered beyond the scope of this dissertation to develop and outline training requirements of those employing the guidelines to implement CEEP. Lee's (1988) analysis of existing EIA training provision and its deficiencies and training guidelines by Lee (1987) and Wood and Gazidellis (1985) provide ideas on what the training requirements for implementing the CEEP guidelines might be.

A further constraint to this study has been the rapidly changing socio-political circumstances in South Africa over the past few years. Political restructuring, including the restructuring of government departments and a review of the roles and functions of existing departments, moves towards regionalization, the delegation of certain powers to local government level, as well as the development of new policies, all have vast implications for CZM and environmental management generally.

It was therefore necessary, on the one hand, to be mindful of the institutional inadequacies in the current system and attempt to address some of these in the

procedural requirements of the evaluation procedure, but also recognise that these conditions are likely to change. Thus the procedure relies not so much on a set of administrative procedures and legal mechanisms to achieve its purpose, but on the commitment of the proponent, relevant authorities and affected public to the principles underpinning the procedure and their participation in the processes driving it. Although preliminary proposals are given regarding the type of institutional framework within which the CEEP could operate, it is recognised that these issues are being currently debated by all future role players and it would be presumptuous to be prescriptive in this regard. The main focus has thus been to develop a theoretically sound and broadly acceptable environmental evaluation procedure applicable to coastal proposals which could be applied under a variety of institutional conditions.

The various initiatives and socio-political changes described above, as well as time and financial constraints, prohibited the practical application of the procedure. However, aspects of the environmental evaluation procedure, such as the scoping procedures, proposals for public participation and methods for assigning significance have been applied in various case studies and consultancy projects. The testing and validation of the procedure should thus constitute the next stage in the development of the procedure.

## STRUCTURE OF THE DISSERTATION

This dissertation comprises an overall introduction, two main parts and a conclusion. Part 1 examines the concepts, theoretical underpinnings and status of EIA, CZM and public participation. It unpacks and clarifies these concepts, highlights areas of weakness and obstacles to effective implementation, and puts forward proposals and practical suggestions for improvement.

This introductory section has outlined the nature of the problem, the aims and objectives of the study and the approach followed to develop the coastal evaluation

procedure. It provides an overview of the topics reviewed and investigated in this dissertation, as well as the rationale for addressing the key questions required to inform the development of the evaluation procedure.

Part 1 is presented as a series of five papers, which have either been published or are in the final stages of publication. Each paper deals with one or more of the key questions identified earlier, answers to which provide the information and understanding required to develop a CEEP appropriate to the South African context. Whilst Part 1 of this dissertation comprises five stand alone papers, this introductory section as well as the preface to Part 1, should provide an understanding of the linkages between each paper and the logical progression of ideas in the development of the procedure. Table 1 provides an overview of the objectives and key questions addressed in each paper.

Paper 1 provides the theoretical background on the two central subjects of this dissertation, namely CZM and EIA. It describes the key characteristics and requirements of CZM and EIA and provides an assessment of their global status. A review of the use and effectiveness of EIA as a management strategy to further the goals of CZM-type programmes is then undertaken.

A review of the status of CZM in South Africa, in terms of policy and programme formulation, strategies employed to further CZM efforts and issues regarding implementation, is given in Paper 2. Existing strategies and current initiatives which would influence the development of an evaluation procedure for coastal development proposals are discussed. Obstacles to achieving effective CZM are identified and action required to achieve an ICZM Programme in South Africa is recommended.

Paper 3 provides an overview of the evolution of environmental evaluation procedures in South Africa, as well as some insights into the socio-economic, political and practical considerations which influenced the EIA system eventually proposed for South Africa. The principles, key characteristics and requirements of IEM (DEA 1992), the recently developed generic procedure for evaluating all

**TABLE 1: RELATIONSHIP OF PAPERS TO OBJECTIVES AND KEY QUESTIONS**

PAPER NUMBER	OBJECTIVES	KEY QUESTIONS
Paper 1	<p>1. To review and assess the use and effectiveness of EIA as a management strategy in CZM-type programmes with a view to addressing and developing areas of weakness, thus improving its practical application to proposals affecting the South African coastal zone.</p>	<p>1. What are the key characteristics of, current trends in, and future directions of, EIA and CZM?                  2. How well is EIA performing in achieving the goals set for it? What are the key areas of weakness in the EIA process and what factors inhibit its effective implementation?                  3. To what extent, and to what effect, are formalised EIA procedures being currently employed as a strategy to enhance coastal zone management efforts?</p>
Paper 2	<p>2. To assess the status of CZM in South Africa, paying particular attention to the strategies employed to achieve the conservation and sustainable use of coastal resources, identify obstacles to achieving effective CZM and recommend action to improve efforts.</p>	<p>4. What is the status of CZM in South Africa and how well is it performing in terms of the requirements of Integrated Coastal Zone Management (ICZM)? What action is required to improve CZM efforts in South Africa?</p>
Paper 3	<p>3. To review the evolution, philosophical underpinnings and current status of environmental evaluation in South Africa in order to inform the development of detailed evaluation procedures for coastal proposals.</p>	<p>5. Is EIA being used as an instrument of environmental management, and more specifically, coastal zone management, policy development and practices in South Africa? If so, what are the guiding principles and characteristic features of the South African EIA system?</p>
Papers 4 and 5	<p>4. To examine the concept and practice of public participation in the EIA process and explore ways of broadening its scope and making it more operational.</p>	<p>6. To what extent, and how, are the public, including disadvantaged communities, involved in the environmental planning, assessment and review process?                  7. How can public participation be made operational in the environmental planning, assessment and decision-making process?</p>
Paper 6 and Guideline Documents	<p>5. Based on the above, to develop an environmental evaluation procedure for proposals affecting the coastal zone, which provides a structural framework for undertaking the tasks of EIA, gives guidance on the processes by which these tasks may be accomplished, and provides tools and guidelines, to assist with implementing these tasks.</p>	<p>8. What should the characteristic features and processes of a coastal evaluation procedure be to ensure that environmental issues and community concerns are better integrated in all aspects of coastal planning, environmental assessment, decision-making and development?                  9. What simple and cost-effective methods can be employed and what tools should be developed to assist with the tasks of the evaluation procedure?                  10. What institutional mechanisms should be created to implement the CEEP?</p>

proposals, including policies, programmes, plans and projects likely to affect the environment, are outlined.

In Papers 4 and 5, the issue of improving the practice of public involvement in the planning, environmental assessment and decision-making process is explored. Measures for broadening the scope of public participation and making it more operational, in all aspects of the environmental evaluation process are put forward in Paper 4. Difficulties of involving disadvantaged communities in the tasks of planning and EIA are highlighted in Paper 5. An assessment of the public participation process followed in a project involving poor, landless communities, as well as insights gained from action research undertaken by the author in this and other disadvantaged communities, provided some ideas on how these difficulties may be addressed.

Part 2 describes the proposed CEEP and provides six guideline documents for its implementation. It begins with Paper 6 which explains the proposed CEEP. The key issues emerging from the various reviews, investigations and case studies, which informed the development of the proposed procedure, and determined its structure and processes, are outlined. There then follows a description of the characteristic features and processes of the CEEP, as well as guidance on how the various tools, and guidelines such as criteria, questionnaires, checklists and technical advice notes, developed to assist with activities of this evaluation procedure, can be employed to implement the procedure. Preliminary proposals are made regarding institutional arrangements for implementing CEEP. This final paper is supported by six guideline documents which provide practical advice and suggestions for undertaking the tasks required of the evaluation procedure.

In the conclusion, the key findings emanating from the various reviews, investigations and case studies which led to the development of the CEEP are highlighted. A summary of the key features and linked activities of the CEEP are outlined. Comments on the adequacy, soundness and cost-effectiveness of the proposed procedure are made. Aspects of the evaluation procedure requiring further

development and refinement are identified and recommendations for testing its effectiveness are made.

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# PART 1

Part 1 of this dissertation examines the concepts of environmental impact assessment (EIA), coastal zone management (CZM) and public participation and provides the theoretical background for development of the coastal environmental evaluation procedure (CEEP). It unpacks and clarifies these concepts, highlights areas of weakness, identifies obstacles to the effective implementation of EIA procedures, CZM and public participation programmes, and puts forward proposals and practical suggestions for improvement.

Part 1 begins with Paper 1 which reviews the effectiveness of EIA as a management strategy to further the goals of CZM-type programmes. It examines the shortcomings in the EIA system, identifies weaknesses in the application of EIA and highlights factors limiting its effectiveness, explores how these may be overcome and how the principles and procedures of EIA can be more effectively harnessed to enhance CZM efforts.

In Paper 2, attention is focused on the status of CZM in South Africa. It examines the nature and effectiveness of strategies employed to further CZM efforts and makes recommendations to address shortcomings and obstacles.

Paper 3 provides an overview of the evolution of environmental evaluation procedures in South Africa, as well as some insights into the socio-economic, political and practical considerations which influenced the EIA system eventually proposed for South Africa. The principles, key characteristics and requirements of Integrated Environmental Management (DEA, 1992), the recently developed generic procedure for evaluating all proposals, including policies, programmes, plans and projects likely to affect the environment, are outlined.

In Paper 4, the limited opportunities for public involvement in environmental planning and decision-making are highlighted. The issue of improving the practice of public involvement in the planning, environmental assessment and decision-making process is explored. Measures for broadening the scope of public participation and

making it more operational, in all aspects of the environmental evaluation process are put forward.

Paper 5 explores the difficulties and challenges surrounding the involvement of disadvantaged communities in the environmental planning, impact assessment and decision-making processes. An assessment of the public participation process followed in a project involving poor, landless communities, as well as insights gained from participatory research undertaken by the author in this and other disadvantaged communities, provided some ideas on how these difficulties may be addressed.

## PAPER 1

# A REVIEW OF EIA AS A MANAGEMENT STRATEGY IN COASTAL ZONE MANAGEMENT PROGRAMMES\*

### INTRODUCTION

Most developed and many developing nations recognise their coastal zones as a functional region with valuable resources and distinctive attributes, requiring effective planning approaches and special management attention (Clark, 1985 and 1989; Halliday, 1988; CAMPNET, 1991; Sorensen and McCreary, 1990; Meister and Rosier, 1992). The value of coastal resources and ecosystems, in terms of providing a diversity of economic and environmental goods and services (Burbridge et al., 1989; Brower et al., 1991; Clark 1989) and serving peoples' spiritual, cultural, recreational and aesthetic needs (Department of Conservation, 1992) have provided the rationale for coastal nations to develop new approaches and formulate programmes to promote the integrated management and sustainable use of coastal areas and resources. Increasing interest amongst developing nations to initiate coastal zone management (CZM) type programmes can be attributed to a recognition that coastal resources provide the foundations upon which economic and social development programmes may be constructed and supported (Sorensen and Brandani, 1987; Ministerio de Energia y Minas et al., 1988; Clark, 1989).

The development of national policies and integrated management programmes, to ensure the sustainable use and development of coastal areas and resources, has been recommended by the World Conservation Union (1980, 1991). It is also one of the proposals in Agenda 21, a non-binding plan of action emanating from the Rio United Nations Conference on Environment and Development (Wynberg, 1993). Likewise, the Organisation for Economic Co-operation and Development (OECD) countries are focusing on integrated coastal management as a means of avoiding

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\* Paper submitted to journal of **Coastal Management**

further environmental degradation (OECD, 1988). Many international aid agencies are also encouraging the initiation of such programmes (Sorensen and Brandani, 1987).

The overall goal of most CZM-type programmes is to promote the conservation and sustainable multiple use of coastal resources and areas. Various sub-goals and more specific objectives would be defined depending on the issues motivating the formulation of the programme, the focus of the programme, and the political context and institutional arrangements within which the programme evolved. In order to achieve these goals and objectives, a variety of management strategies to implement these programmes have been employed (Healy and Zinn, 1985; Brandani and Schnack, 1987; Sorensen and McCreary, 1990; CAMPNET, 1991).

Environmental Impact Assessment (EIA), a procedure for identifying, assessing and communicating the environmental (including social, economic, cultural and political) consequences of any policy, programme, plan or project, is recognized as an integral management strategy of any CZM effort (Clark 1989; Sorensen and McCreary 1990; Sorensen and West, 1992). In fact, EIA is considered by some to be a minimum requirement of such a programme (Clark, 1989).

This paper is mainly concerned with examining the extent to which countries engaged in developing and/or implementing CZM-type programmes are employing formalised EIA procedures as a management strategy, and the effectiveness of its application in achieving the goals of their programmes. Since most of the literature relating to these topics is focused on the developed countries, the emphasis of this review is directed more towards understanding the situation in developing countries. Because of the author's familiarity with the situation in South Africa, examples are frequently quoted from there.

This review thus focuses on the following issues and questions:

1. The status of, and current trends in, CZM and EIA;

2. The extent to which formalized EIA procedures are employed as management strategies in CZM-type programmes;
3. The scope of application of EIA procedures - is EIA applicable to policies, programmes, plans and projects, or is its application limited to development projects;
4. To determine whether EIA procedures employed to assess coastal proposals are generic or nationwide procedures applicable to all proposals likely to result in significant impacts irrespective of the environmental context, or whether distinctive EIA procedures have been developed for proposals affecting, or located in, the coastal environment;
5. An assessment of the effectiveness of EIA in achieving the goals of CZM programmes; and
6. Finally, how the principles and procedures of EIA can be more effectively harnessed to achieve the overall goals of CZM.

The paper begins by outlining the approach used in the study. Thereafter it provides definitions of the central concepts under examination as well as a brief discussion of their global status.

## APPROACH TO THE STUDY

Information for this review was based upon an extensive literature search in the fields of coastal zone/resources management and environmental impact assessment/evaluation. The key journals covering these two topics were reviewed for relevant articles. These included: Coastal Management, Ocean and Shoreline Management, Journal of Coastal Research, Journal of Environmental Management, Environmental Impact Assessment Review, Impact Assessment Bulletin and

Environmental Management. In addition, the proceedings from the biennial international conferences on Coastal Zone Management were scanned for information.

The initial literature review provided an overview of efforts in various countries to develop and implement CZM policies and programmes, with few articles reporting in detail on management strategies employed to implement the programmes. A review of the impact assessment literature provided an understanding of the EIA procedures followed in various coastal countries, recent developments in the field, as well as areas of weakness which may limit the effectiveness of EIA as a management tool.

In order to gain more specific information regarding the application of EIA to coastal proposals and its effectiveness in furthering the goals of CZM-type programmes, a questionnaire was designed and sent to coastal managers in 30 countries. In the USA, Australia and Canada, questionnaires were sent to a few different states or provinces since approaches and strategies adopted by the states differ.

The primary reason influencing the selection of countries in the questionnaire survey was that the literature had indicated that a country was involved in the development and/or implementation of aspects of CZM and had applied EIA or some form of regulatory system for reviewing coastal proposals. From this information a list of potential participants was drawn up, with a view to selecting an equal number of respondents from both developed and developing countries.

The availability of information such as contact person, address or fax number of the agency or unit involved with aspects of CZM or EIA implementation in a candidate country (for example by referring to the Coastal Directory (Coastal Zone Foundation, 1991)), in some cases served to guide the final choice.

In addition to completing the questionnaire, respondents were asked to send the author additional information on their CZM programme, and if available, detailed

information on the environmental evaluation procedures followed for coastal proposals. Twenty-four of the 30 questionnaires sent were completed and returned which represents a response rate of 80%.

## INTEGRATED COASTAL ZONE MANAGEMENT

### **Definition, Key Characteristics and Global Status.**

The terms coastal management, coastal resources management, coastal zone management, coastal area management and planning, and all the above terms prefixed with "integrated" are used interchangeably in the literature to describe the activity of managing a coastal area or resource (Sorensen and McCreary, 1990).

At a workshop in Charleston, USA in 1989 (CAMPNET, 1991), attended by approximately 30 coastal managers, professionals and academics involved in the field of coastal management, it was agreed that the term integrated coastal zone management (ICZM) was the most appropriate term to describe the activity of managing a coastal environment. After much debate the following definition was formulated:

"ICZM is a dynamic process in which a co-ordinated strategy is developed and implemented for the allocation of environmental, socio-cultural and institutional resources to achieve the conservation and sustainable multiple use of the coastal zone" (CAMPNET, 1991).

It was agreed that an ICZM programme should be characterised by the following six attributes. These have been described elsewhere in the literature (Sorensen and Brandani, 1987; Sorensen and McCreary, 1990) and are therefore only summarised below.

1. It is usually initiated by government in response to issues such as coastal hazards or coastal use conflicts;
2. It is an on-going dynamic process;
3. Government arrangements are established to formulate and implement policies for coastal resource allocation decisions;
4. One or more management strategies are employed to rationalize and systematize resource allocation decisions;
5. The selection and implementation of management strategies requires a systems perspective and multi-sectoral approach; and
6. Its geographic boundaries vary but define an area which extends from a seaward limit across the transitional shore environment to some inland limit.

A diagrammatic representation of the components of an ICZM programme has been developed by the author and is presented in Figure 1.

Of particular relevance to this review, are the management strategies being employed to further ICZM efforts. Brandani and Schnack (1987) identified 10 management strategies, currently being employed in developed and developing countries.

These include :

1. National Economic Planning,
2. Sectoral Planning
3. Regional Plans
4. Land-use Planning
5. Special Area Plans

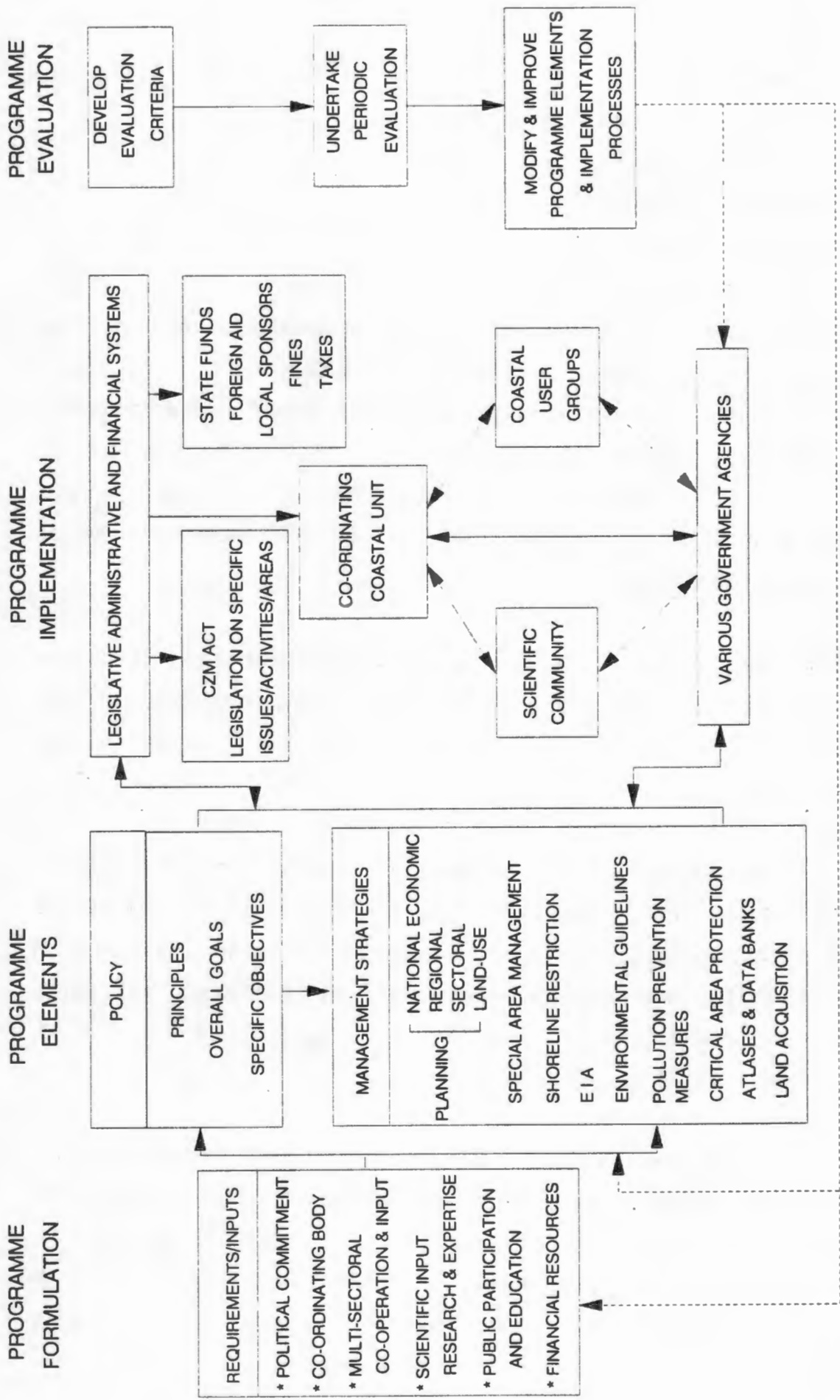


FIGURE 1. COMPONENTS OF AN ICZM PROGRAMME

6. Shoreline Restriction
7. Environmental Impact Assessment (EIA)
8. Environmental Guidelines
9. Critical Area Protection and
- 10 Atlases and Data Banks.

An eleventh strategy has been identified as the development of and participation in the Regional Seas Programme. This programme, initiated by the United Nations Environmental Programme, is concerned with the development of an action plan to address trans-boundary issues such as coastal and marine pollution (Sorensen and McCreary, 1990). The absence of strategies to deal with pollution problems suggests that a further strategy concerned with pollution prevention measures should be added to this list.

Another strategy not listed above, but employed in various countries to enhance coastal management efforts, is the acquisition of coastal land which has conservation value or which is needed to achieve the goals of coastal planning proposals.

This list is not necessarily exhaustive but represents the strategies most commonly used (Figure 1). Of these strategies, the most commonly employed in developing countries appear to be sectoral planning, shoreline restriction, designation of protected areas, EIA, environmental guidelines and coastal atlases or data banks (Sorensen and Brandani, 1987; Brandani and Schnack, 1987; Clark, 1989; Sorensen, 1990; Suki et al., 1991).

The literature indicates that a broad array of institutional arrangements are being employed to manage coastal areas and achieve the goals of CZM. Management of the coastal zone inevitably involves many sectors and a large number of different government departments at various levels. Few countries have an inter-departmental entity in existence which could take responsibility for developing and implementing an ICZM-type programme. The most common arrangement appears to be the

identification and possible expansion of an existing government entity or agency - a lead agency - already involved in coastal management issues. The functions of this agency include the co-ordination of the various CZM sector efforts, formulation of policy and overall guidance of programme development.

There are various administrative arrangements for managing and implementing the programme but the most workable appears to be through establishing a "network" or linkage between and amongst the various relevant agencies and organisations with interests, functions and responsibilities in the coastal zone (Figure 1). "Networking" with coastal user groups, including the scientific community, business, recreational and manufacturing interests such as tourism and fisheries would also be required (Born and Miller, 1988; Clark, 1989; Looi, 1989; Sorensen and McCreary, 1990; Premaratne, 1991).

The legislative framework supporting various CZM efforts varies significantly amongst countries. In some countries (e.g. California, Costa Rica and Sri-Lanka), the CZM programme is given status through the promulgation of a co-ordinated piece of legislation whilst in other countries (e.g. the state of Delaware, Japan, Canada, South Africa), several different laws are harnessed to provide the statutory framework for implementing the programme. Others have still to gain supportive legislation for their efforts.

Clark (1989) considers the distinctive feature of an ICZM programme, as opposed to other environmental management programmes, to be that coastal waters and adjacent lands are addressed together in a unified programme. On the other hand, Sorensen and McCreary (1990) consider the distinguishing factors to be the adoption of a systems perspective and a multi-sectoral approach in programme formulation and implementation.

Efforts and initiatives towards achieving integrated coastal zone management programmes have reached different stages in different countries. The various efforts have taken on different forms and focuses depending on:

- the issues motivating initiation of co-ordinated action;
- the level of co-operation between various agencies involved in coastal-related activities;
- the priority afforded CZM issues by the public and politicians;
- resources and expertise available; and
- the political styles and institutional arrangements available for developing and implementing the programme (Halliday, 1988).

Whilst this review suggests that most nations have initiated efforts and are employing a variety of strategies to improve the management of their coastal resources and guide development on a more sustainable path, few countries have developed ICZM programmes which conform with the CAMPNET (1991) definition and fully embrace the six attributes described above.

In addition, the literature review as well as responses from the questionnaire survey suggest that coastal managers have different conceptions of what characterizes an ICZM programme (Table 1). Respondents from China, for example, regarded the status of their programme to be comprehensive, yet, in terms of Sorensen's six attributes and from Degong's (1989) article which reports on CZM in China, it appears that China is only at the initial stages of programme formulation (Table 1). Japan's sectoral approach to resolving management problems in the coastal zone (Shapiro, 1984) suggests that one of the pre-requisites for programme initiation have not yet been met.

South Africa, on the other hand, has developed a variety of tools, such as a series of coastal sensitivity maps (Theunissen and Heinecken, 1989) and a coastal GIS system (Watermeyer, Prestedge and Retief, in press), and employs a variety of strategies, such as coastal structure plans, guidelines for coastal land-use and a

**TABLE 1: STATUS OF CZM IN PARTICIPATING COUNTRIES\***

COUNTRIES	INITIAL STAGES	ASPECTS DEVELOPED	ASPECTS DEVELOPED & IMPLEMENTED	COMPREHENSIVE PROG IN PLACE
Brazil			X	
Colombia			X	
Thailand			X	
Sri Lanka			X	
China				X
Philippines				X
Indonesia			X	
Malaysia	X			
Taiwan	X			
Nigeria		X		
Tanzania	X			
South Africa		X		
Canada - NB		X		
United Kingdom	X			
Netherlands			X	
Japan	X			
USA - California			X	
USA - NY				X
USA - Mass.				X
USA - R.I.				X
Australia - Vict.	X			
Western Australia				X
Australia - NSW				X
New Zealand				X

\* Information provided by questionnaire respondents

network of protected areas to promote the conservation and sustainable use of the coastal zone (Sowman, 1993). Yet, in terms of the definition and requirements of what constitutes a ICZM programme, South Africa's efforts must be considered extremely limited. Firstly, there is no overall co-ordinating agency for all coastal zone matters. Secondly, the boundaries of the coastal zone have not been clarified (Sowman and Glazewski, 1987). Thirdly, there is no coastal policy in place, although several documents relevant to policy have been published (Council for the Environment, 1989, 1991; Kapp Prestedge and Retief, 1992). And finally, formal co-ordination between the various government departments and sectoral interests is limited.

Despite these shortcomings, much work has been undertaken in South Africa in all of the above areas (Heydorn et al., 1992; Sowman, 1993). The failure to designate boundaries, declare policy and establish a co-ordinating agency can be attributed to legislative inadequacies, limited public awareness and support, institutional shortcomings and limited capacity. I would argue that the condition of South Africa's coastal areas and resources suggests that these various efforts, whilst not within a unified programme, are by comparison to many other third world countries with so-called ICZM programmes in place, achieving a measure of success.

Thus, there appears to be a general lack of awareness and agreement as to the requirements of an ICZM programme. Furthermore, most coastal nations (except perhaps where programmes have been initiated by USA institutions and international aid organisations) are not positioned on an evolutionary path which culminates in the implementation of an ICZM programme. Rather, the impression created from the literature is that most coastal nations have recognised the enormous value of their coastal resources and are taking steps to co-ordinate and improve the various CZM efforts and direct utilization and development of the coastal zone on a more sustainable course. The approaches taken and strategies employed vary amongst nations. The effectiveness of these efforts is highly dependent upon political styles, institutional arrangements and capacities, levels of expertise, resources, data availability and management and public support.

## ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

### **Definition, Characteristics and Global Status.**

The introduction of the National Environmental Policy Act in the United States in 1969, and its requirement to undertake Environmental Impact Assessments (EIAs) of actions significantly affecting the quality of the human environment, was a political response to increased public concern about the detrimental effects of development activities. EIA is not fully embodied in the decision-making process in many countries (Lee and Walsh, 1992). There is no universally accepted definition of EIA but most definitions suggest that EIA is a procedure concerned with the identification and assessment of the environmental consequences of development projects, plans, programmes and policies, and the communication of this information to aid decision-making. The term "environment" is used in its broadest sense to include bio-physical, socio-economic, cultural, and political aspects. "Assessment" in this definition is concerned with analysing and evaluating impacts on the environment (McAllister, 1980; Westman, 1985). There is an important distinction between analysis and evaluation since analysis is essentially an objective task which involves identifying interactions and impacts, taking measurements and predicting changes that are likely to occur as a result of an action (Westman, 1985). Evaluation however, requires synthesising the objective data into an integrated view and assigning significance, which is a subjective judgment, largely dependent on the application of human values (Matthews, 1975; McAllister, 1980; Lee, 1982; Westman, 1985).

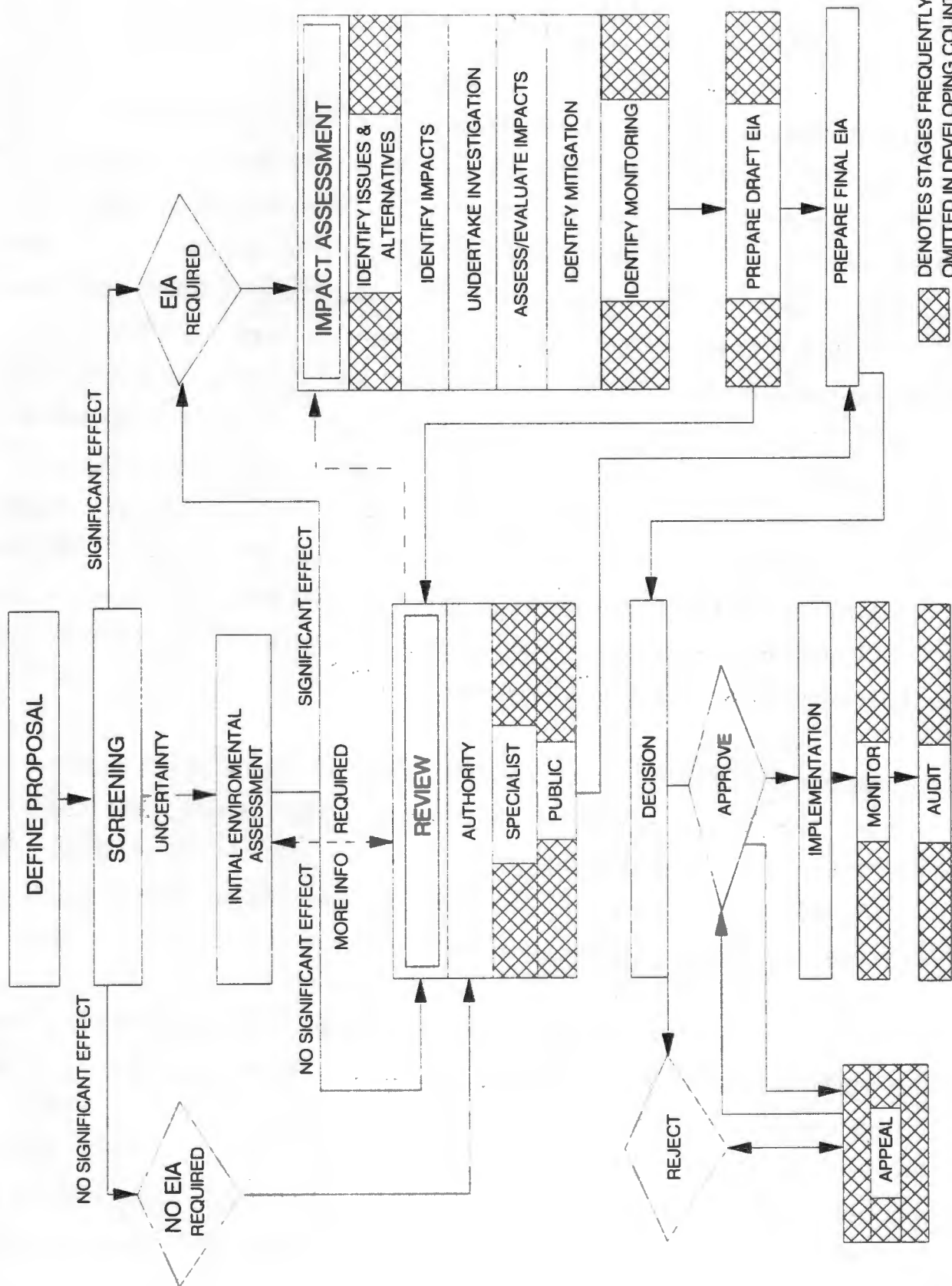
Review of the EIA literature suggests that there is a common impact assessment process that does not vary significantly amongst different nations (Biswas and Geping, 1987; Lee, 1988; Wathern, 1988; Sorensen and West, 1992), although certain components are less developed or absent in developing countries. Whilst there are variations in the detailed procedural requirements, most EIA procedures incorporate the following components:

1. Definition of Proposal
2. Screening
3. Scoping
4. Consideration of Alternatives
5. Investigation, Prediction and Analysis
6. Evaluation
7. Presentation of Results
8. Review and Comment
9. Monitoring and Auditing.

A flow diagram showing the main components of an EIA procedure, including some of the key differences between developed and developing countries, is presented in Figure 2.

According to EIA theorists (Jain et al. 1977; Munn, 1979; Bisset, 1982; Lee, 1983; Clark, 1984; Hollick, 1986; Lee, 1988; Wathern, 1988), the primary purpose of undertaking an EIA is to disclose the environmental consequences of a proposed action, thereby alerting the decision-maker, the public and politicians to the environmental risks involved. The principles underpinning this stated purpose are therefore:

1. Full disclosure of information relevant to the proposed action, its impacts and implications;
2. Effective involvement of the public throughout the planning, assessment and decision-making process;
3. Consideration of alternative courses of action to meet the stated need of the proposal;
4. Integration of environmental considerations and community concerns throughout the planning and decision-making process;



FLOW DIAGRAM SHOWING KEY ELEMENTS OF EIA PROCESS

FIGURE 2.

 DENOTES STAGES FREQUENTLY OMITTED IN DEVELOPING COUNTRIES

5. Accountability for decisions taken; and
6. An iterative process involving feedback of EIA findings and modifications to the planning and design stages.

EIA procedures are at various stages of development and application throughout the world. The literature contains several reviews of the status of EIA, in terms of procedural and technical requirements, institutional arrangements for supporting its implementation, as well as methods and techniques for undertaking EIA (Munn, 1979; Bisset, 1980; Wandesforde-Smith, 1981; O'Riordan and Sewell, 1981; Clark et al., 1984; Shopley and Fuggle, 1984; Schweizer, 1985; Biswas and Geping, 1987; Bisset, 1987; Lee and Colley, 1990; Lee and Walsh, 1992; Lemons and Porter, 1992). An assessment of the effectiveness of EIA as a planning and management tool suggests there are a number of areas of weakness which reduce its utility for decision-making and where improvement is required. These include weaknesses inherent in the EIA process itself, limitations of the methods and techniques employed and the failure to integrate EIA processes into planning, programme and policy formulation exercises. These weaknesses, which are discussed below, are particularly acute in developing countries.

Firstly, the identification and serious consideration of alternatives to the proposed action have not been adequately addressed (Lim, 1985; Hollick, 1986; Kennedy, 1988; Lee and Walsh, 1992; Sorensen and West, 1992). Whilst consideration of alternatives is a legislative requirement in many developed countries (e.g. U.S.A., Canada, Netherlands) it is rarely considered in developing countries.

Secondly, opportunities for effective public participation are limited and appropriate methods of involving communities (especially where heterogeneous and illiterate communities may be affected by a proposal) are seldom sought or applied (Lim, 1985; Hollick, 1986; Htun, 1988; Yap, 1990; Sowman, in press). Public participation is usually limited to informing the public of the proposed action and intention to undertake an EIA, and providing an opportunity to comment on the draft or final EIA

report. Lack of organisational structures, communication skills and limited capacity amongst disadvantaged communities also inhibits participation (Potter, 1985; Moser, 1989). This issue requires urgent attention.

Thirdly, the focus of EIA has been on identifying and assessing the negative impacts associated with a proposal. Little attention has been given to identifying the positive impacts of alternatives and seeking ways to enhance or maximise such impacts (Department of Environment Affairs, 1992; Biswas and El-Habr, 1993).

Fourthly, the methods of assessment employed in developing countries are generally too complex, too ambitious, and too quantitative for the available expertise (Ahmad and Sammy, 1987; Biswas and Geping, 1987). Impact assessment methods have focused on impact identification techniques (Brown, 1990), whilst the tasks of impact prediction, significance determination and evaluation, and the analysis of probability and risk, are methodologically wanting (Lee, 1982; De Jongh, 1988; Andrews, 1988; Stauth, 1989, Brown, 1990; Thompson, 1990). Methods for evaluating cumulative and synergistic effects are also considered to be inadequate (Rees, 1988; Stauth, 1989; Sorensen and West, 1992; Bardecki, 1990; Lee and Walsh, 1992). Furthermore, failure to make explicit areas of uncertainty, methods of integrating subjective value judgements and decision-criteria, reduces the credibility of EIA (Mathews, 1975; De Jongh, 1988; Henderson, 1992). In addition, the issue of conflict, whilst common to many impact assessment situations, has not been explicitly recognised and catered for in EIA. Nor is there much literature providing the theoretical underpinnings and methodological guidelines for dealing with conflict-resolution in EIA (Susskind and McCreary, 1985; Westman, 1985; Rickson et al., 1990). A better understanding of how conflict affects assessment methodology is required. Also, the application and integration of methods of conflict-resolution, including negotiation, mediation and partnering in the impact assessment process, requires development.

Fifthly, the practice of undertaking EIA as a separate activity rather than being an integral part of the planning process is considered to be a major weakness of EIA

(Whitaker, 1984; Lim, 1985; Wood, 1988; Armour, 1990; Brown, 1990; Fuggle, 1990; McDonald and Brown, 1990; ).

A sixth area of weakness is the trend of conducting EIA's in the absence of a broader policy and programmatic context, and without knowledge of potentially competing resource uses. This limits the assessor's ability to assess significance of individual projects and accurately predict cumulative impacts (Westman, 1985; Rees, 1988; Lee and Walsh, 1992; Sorensen and West, 1992). The process of nesting specific EIA's within a hierarchical or "tiered" system from policy to programme to specific project (Lee, 1982; Westman, 1985; Lee and Walsh, 1992) is a further area requiring development.

Internalization of EIA in the planning and decision-making process of all actions including projects, plans, programmes and policies is probably the key focus in the EIA field at the present time (see for example *Impact Assessment Bulletin*, Volume 8, 1989). Extending the scope of EIA to the planning, development and assessment of plans, programmes and policies, and instituting the practice of "tiering" assessments (Lee, 1982) constitute major challenges for the future development of EIA.

Finally, the focus of EIA has been on the production of an Environmental Impact statement (EIS) to inform decision-making. Far more important is that the processes followed in generating the product - those of planning, information exchange, public participation, assessment and decision-making - are appropriate to the task at hand and acceptable to all parties. The emphasis should thus be on the process of assessment and decision-making, rather than on its outcome (McCool, 1988; Sorensen and West, 1992).

The current direction in the development and refinement of the EIA process reflects an awareness of these inadequacies. These inadequacies are particularly evident in the procedural aspects of EIA in most developing countries.

However, irrespective of how good, how advanced and well adapted the procedural models are to conditions in developing countries, these procedures are not self-sustaining and self-regulating (Wandesforde-Smith et al., 1985). Weaknesses in the application of EIA can be largely attributed to lack of political will and commitment to environmental concerns, inadequacies in the institutional arrangements for implementing EIA, lack of appropriately trained personnel for undertaking and managing the EIA process as well as limited resources, technical competence and data (O'Riordon and Sewell, 1981; Horberry, 1985; Lim, 1985; Roque, 1985; Htun, 1988; Moreira, 1988; Sorensen and West, 1992).

It is extremely difficult to come up with generalities regarding how well EIA is performing in different countries. However, from the literature the following conclusions can be drawn:

1. Implementation of EIA in most developed countries does influence decision-making resulting in changes to proposals and environmental management conditions (Hollick, 1986; Wathern, 1988). However, EIA's are still mainly undertaken at the project level despite the volumes of literature advocating its application to policies, programmes and plans.
2. Whilst there is a degree of variation in EIA performance in developing countries (Horberry, 1985), the overall impression is that it is performing a limited role. Its main focus has been on the identification of impacts and possible mitigatory measures associated with a course of action already decided upon (Lim, 1985; Htun, 1988; Wandesforde-Smith et al., 1985; Moreira, 1988).

In a review of the practice of EIA in the Asian Nations, Roque (1985) reports that even where remedial measures have been recommended in the EIA reports, they have seldom been implemented. Thus far, the influence of EIA on the planning and design process in developing countries has been negligible. It has rarely led to consideration of alternatives or resulted in modifications to plans. The practice of

conducting an EIA of projects separate from the planning process for the project does not, and will not, achieve the objectives of EIA in developing countries (Armour, 1990; Brown, 1990).

One of the key reasons for the poor performance of EIA's in developing countries has been the direct transfer of complex EIA procedures and sophisticated, expensive and time-consuming methodologies from industrialised countries to these countries (Biswas and Geping, 1987). If EIA is to be of practical value in developing countries, it is necessary to develop clearly structured EIA procedures which use appropriate methodologies and aids, such as guidelines and technical advice notes, to assist with the tasks of impact assessment. This needs to be accompanied by an assessment of training requirements of personnel engaged in the EIA process and the provision of appropriate training programmes.

Of particular concern in many developing countries is that environmental goals are mostly conceived as different from and subordinate to, national economic development goals. Consequently environmental issues are not afforded high priority on the political agenda and the agencies charged with responsibility for implementing and reviewing EIA's, usually lack authority. Even in countries such as Korea and the Philippines where environmental conservation has been identified as an explicit goal of national development and EIA has been designated as a tool for achieving such goals, the relatively lower status of the EIA review agency in the governmental hierarchy severely limits its effectiveness (Lim, 1985).

Furthermore, and most importantly, the political style in many developing countries does not support some of the key principles underpinning the EIA process, namely that there be broad public participation in planning and decision-making, free access to information, full disclosure of a proposal and its likely impacts as well as accountability for decisions taken. Moreira (1988) considers the authoritarian character of several governments in Latin America to be one of the strongest obstacles to the institution of an effective EIA process in these countries. A better understanding of the relationship between political style/institutional structure for EIA

implementation and performance outcome of EIA may provide some direction regarding future efforts for improving the practice of EIA in developing countries (Lim, 1985).

## EMPLOYING EIA AS A MANAGEMENT STRATEGY WITHIN CZM PROGRAMMES

This section of the paper is concerned with examining:

- the extent to which formal EIA procedures are applied to coastal proposals by nations involved in CZM efforts;
- the scope of its application;
- the nature and characteristics of EIA procedures implemented to evaluate coastal proposals; and
- the effectiveness of EIA in achieving CZM programme goals.

Recommendations as to how EIA may be more effectively applied within CZM programmes are given. These recommendations draw on results obtained from the questionnaire survey as well as information gleaned from published papers and unpublished material such as internal reports, manuals and legislation.

### **Extent to which Formalized EIA's are Applied to Coastal Proposals**

Before reviewing how extensively EIA is being employed by nations involved in CZM, it was useful to first gain an indication of the status of their CZM efforts or programmes. Information obtained from 24 coastal nations participating in the questionnaire survey provides an overview of how selected coastal nations in both developed and developing countries consider their CZM efforts (Table 1). An

analysis of these responses in terms of the requirements of a CZM programme has been given in an earlier section of this paper.

Nineteen of the 24 countries, participating in the questionnaire survey, indicated that a formal requirement exists for some form of EIA to be undertaken for coastal proposals. Amongst the developed countries surveyed all, except Japan, indicated that coastal development proposals were subject to environmental evaluation procedures.

Seven of the 12 respondents from the developing nations indicated that under certain conditions EIA's were a mandatory requirement for projects located in the coastal zone (Table 2). In the remaining countries, the government or responsible authorising agency, may request that an EIA be undertaken for coastal developments. In the case of South Africa, pressure from the public has on occasion forced government departments and private developers to undertake an EIA for coastal projects prior to decision-making (Hey, 1983; Grindley, 1989; Steffen, Robertson and Kirsten, 1991; CSIR Environmental Services, 1993).

Whilst the questionnaire survey provides a good overview of the use of EIA in developing nations of the Asian and Pacific region, further information on its application to coastal proposals in Latin America and Africa was sought from the literature. According to Sorensen and Brandani (1987), seven nations in Latin America employ EIA as a strategy to achieve coastal area management objectives. These include Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Venezuela. As far as Africa is concerned, there is a dearth of information regarding EIA and CZM efforts. At a workshop on coastal management for the West African region, held in 1987, participants, whilst recognising the value of their coastal resources agreed that most countries lacked the resources to initiate even simple CZM-type programmes (McCreary and Clark, 1989). With regard to EIA, procedures are either absent or applied on an *ad hoc* basis for major projects, usually financed by international aid agencies (Ortolano et al., 1987; Brown and McDonald, 1989; Olokesusi, 1992). The latter is true for Kenya, Tanzania and Nigeria.

**TABLE 2: STATUS OF EIA PROCEDURES IN SELECTED DEVELOPING COUNTRIES**

COUNTRIES	STATUS OF EIA PROCEDURES	EIA LEGISLATION	EIA REQUIREMENTS IN C.Z.			ADMINISTRATION	EFFECTIVENESS
			MANDATORY		MAY BE REQU.		
			YES	CONDIT.			
Brazil	Procedures Not Clearly Defined	Nat. Env. Policy Law 1982			X	CONAMA (Multi Int Co) SEMA (GOV) Set Rules for EIA - SEMA Reviews	Moderate No Statutory Req. for EIA Review Procedure Unclear
Colombia	Clear Procedures But Key Elements Absent	Nat. Code of Renewable Resources & Protection of Env. 1974	X			Special Function Assigned Institute IDERENA for EIA	Limited Inadequate PP, Multisectoral Input & Consid. of Alta.
Thailand	EIA Procedures Well Developed	Nat. Env. Quality Act 1975, as Amended 1978		X		Nat. Env. Board Co-ord & Review Agency	Limited Restricted to Certain Projects No Req. for PP
Sri Lanka	Procedural Requirements Well Defined	Coastal Conservation Act 57 of 1981		X		Coastal Conservation Dept. Reviews EIA's & Issues Permits	Limited Mainly Undertake Initial EIA's Undesirable Devt Still Occurring
China	EIA Procedures Moderately Developed	Env. Prot. Law 1979 & Marine Env. Prot. Law 1982	X			Env. Prot. Depts at Regional & Nat. Level Review EIA	Limited Focuses on Large Projects Inadequate Consid of Alts & PP
Philippines	EIA Procedures Well Developed	Presidential Decree On Env. Policy 1978		X		Nat. Env. Policy Council Sets Rules for & Reviews EIA's	Moderate - Lack of Status of NEPC, Excessive Powers of President. PP Flexible
Indonesia	EIA Procedures Clearly Defined	Reg. No 29/1986 on EIA Issued		X		Ministry of Population & Env. Co-ords & Reviews EIA	Moderate No Emphasis on Alts
Malaysia	Procedures Well Defined But Key Elements Absent	Amendments to Env. Quality Act 1974. Prescribed Activities EIA Order 1987		X		Dept. of Env. Prepares TOR for EIA & Reviews Projects Approved by Sectoral Authority	Limited Rarely Consider Alts Inadequate PP EIA's Confidential Documents
Taiwan	Procedural Requirements Well Defined	No Specific EIA Legis. May be Req. in terms of Several Acts			X	Env. Prot Agency & Review Committee Review EIA's.	Moderate Need Comprehensive Legis. to Improve Mechanisms for PP
Nigeria	Lack of Procedural Guidelines, Ad-Hoc Approach	No Specific EIA Legislation			X	No Clear Admin. Procedures for Implementing EIA	Very Limited EIA not Mandatory No Procedural Guidelines
South Africa	EIA Procedures Well Developed	Legis. Provisions for EIA Exist But Not Yet Promulgated			X	No Clear Admin. Procedures in Place	Limited No Statutory Req. for EIA Applied On Ad-Hoc Basis Weak Admin Procedures
Tanzania	No Procedures in Place						

Table 2 provides an indication of the legislative base for EIA and the administrative unit responsible for guiding and reviewing EIA's in selected developing countries participating in the survey. An indication of the effectiveness of EIA procedures followed by these countries is also given in Table 2. Of interest, is that Sri Lanka appears to be the only country where decisions regarding the requirement to undertake an EIA, as well as a review of the suitability of coastal proposals, are taken by the administrative unit responsible for co-ordinating the CZM programme, rather than by an agency responsible for general environmental policy and EIA implementation. This will be discussed further when considering the effectiveness of EIA as a strategy to achieve the goals of CZM programmes.

### **Scope of Application of EIA**

While several questionnaire respondents from both the developed and developing countries indicated that EIA was broadly applied to coastal proposals - including development projects, plans, programmes and policies - in practice the application of EIA is limited to the project level. This is reflected in the literature dealing with EIA in the participating countries (Lim, 1985; Biswas and Geping, 1987; Wathern, 1988; Brown et al., 1991; Sorensen and West, 1992; Biswas and Agarwala, 1992). Although there is some evidence that EIA is on occasion being integrated in the formulation of land-use plans (Whitaker, 1984; Collins, 1986; Wood, 1988; Jeffery, 1990) strategic land-use planning (Clark et al., 1984), area wide plans (Foster, 1983), and resource management plans (Williams, 1990), it has rarely been applied to the programme and policy level (Bisset, 1987; Wathern, 1988), and then only applied in a somewhat general and superficial manner.

The questionnaire responses could be interpreted as a recognition of the necessity to extend the scope of EIA, and an intention to apply EIA procedures more broadly. However, the lack of experience and guidance on how to incorporate EIA into the development and appraisal of policies, programmes and plans is probably one reason for the failure to extend EIA to these activities. Other practical problems - such as the reluctance of governments to expose policy proposals to public scrutiny

(Foster, 1983) - are also factors inhibiting the application of EIA to policies and programmes. Certainly, there was no evidence in the literature of EIA's being applied in the formulation, development and assessment of any CZM programmes.

### **Nature and Characteristics of EIA Procedures for Coastal Proposals**

In general the EIA procedures applicable to coastal proposals are generic or nationwide procedures, and apply to any proposals requiring an EIA in terms of the particular country's legislative or administrative requirements, irrespective of the environmental setting. It is likely that specific administrative procedures have been developed for implementing EIA and/or authorising proposals in the coastal zone, such as the procedures developed for reviewing and issuing permits for activities in Sri Lanka's coastal zone (Coast Conservation Department, 1990) and the "Consistency Review Process" applicable to projects located in Alaska's coastal zone (Gallagher, 1990).

While distinctive EIA procedures for coastal proposals are not common, the development and application of specific technical coastal guidelines to aid the tasks of impact assessment are well developed in several developing coastal nations, including Malaysia, Thailand, South Africa and Sri Lanka.

Furthermore, it is likely that many development proposals located in the coastal zone will be subject to EIA procedures, since the screening criteria for projects requiring EIA generally fall into one of the following four categories:

- All proposals likely to result in significant environmental impacts (e.g. USA, Canada);
- Specific Lists of Activities which require EIA procedures (e.g. Japan, South Africa);
- Lists of Activities which occur in the coastal zone (e.g. Thailand, Sri Lanka);

- Designated Environmentally Sensitive Areas, including the coastal zone (e.g. Philippines, Malaysia, Greece).

In South Africa, over the past ten years, various procedures for the environmental assessment of coastal development activities have been developed and circulated to professionals and government departments involved in aspects of coastal management for their consideration (EPPIC, 1980; Retief and Bosman, 1984; Committee for Coastal and Marine Systems, 1986; Sowman, 1987; Retief and Coetzee, 1992). The motivation for developing EIA-type procedures, specifically aimed at coastal proposals, grew out of a concern for the visible degradation of certain coastal areas which could be largely attributed to inadequacies within the planning and project review system governing the coastal zone. However, in the absence of an overall environment policy framework which requires the application of EIA as an instrument of environmental policy, and given the fact that the coastal zone is not managed as a functional unit, further development and implementation of the proposed procedures were considered impractical.

The recently developed Integrated Environmental Management (IEM) procedure (Department of Environment Affairs, 1992; Fuggle et al., 1992(a); Sowman et al., in press) provides an overall framework within which the environmental consequences of development proposals may be adequately considered and communicated to decision-makers. The development of specific EIA procedures and guidelines - for certain activities (roads, dams, resorts) or in particular environments (coastal zone, mountains, river catchments) - within the overall IEM framework is now considered to be desirable and practical (Fuggle et al., 1992(b)).

### **Effectiveness of EIA in Achieving the Goals of CZM Programmes**

Before considering the effectiveness of EIA in achieving or furthering the goals of ICZM, the reader is referred to the earlier assessment of the adequacy of procedural aspects of EIA, as well as the performance outcome of EIA in achieving its objectives. In keeping with the global, albeit general assessment, the responses to

the question which asked respondents to identify the elements which characterise their country's EIA procedures (Table 3), reinforce the findings of the literature review. In summary, the areas of weakness in the EIA procedures of participating developing countries include inadequate consideration of alternatives; lack of public participation at various stages of the process (including the scoping, assessment and review stages); and limited appeal procedures and requirements for monitoring.

The use of complex procedural models and elaborate quantitative and expensive methods to achieve the tasks of impact assessment are also considered areas of weakness. Furthermore, the failure to incorporate EIA in the planning process and conducting EIA's in the absence of broader policies, programmes and plans, limits its effectiveness.

Whilst a high score, in terms of the number of tasks required by an EIA system (Table 3) and a measure of procedural compliance, is desirable, it cannot guarantee the effectiveness of EIA. For example, providing an opportunity for the public to comment on the Final or even Draft EIA Report may fulfill a procedural obligation, with legislative backing, for public participation. However, such limited public involvement severely restricts the effectiveness of EIA as a decision-making tool, since it fails to address community concerns and incorporate local experiential knowledge in the planning, design and decision-making process.

An overall assessment of the effectiveness of EIA procedures - mainly in terms of procedural soundness - in the developing nations that participated in the survey, is presented in Table 2. This analysis draws on a variety of articles and workshop proceedings which comment on the extent to which EIA has achieved the objectives set for it. Even where countries have clearly defined or well developed procedures in place, EIA performance has been limited. Only in four cases has it been considered moderately successful (Table 2). This is partly due to procedural inadequacies, but largely attributable to other obstacles, such as political constraints, the low priority afforded environmental issues, institutional shortcomings, lack of trained personnel, inadequate resources, expertise and data, and poor co-ordination

**TABLE 3: ELEMENTS OF EIA PROCEDURES IN SELECTED DEVELOPING COUNTRIES**

COUNTRIES	CONSIDER ALTS	PUBLIC PARTICIPATION		SCREENING	SCOPING	REVIEW			ADHERE TO GUIDELINES	MGMT PLANS	MONIT-ORING	PERMIT ISSUED	APPEAL PROC
		MANDATORY	VOLUNTARY			AUTHORITY	PEER	PUBLIC					
Brazil	X	X		X		X				X	X	X	
Colombia	X	X							X	X	X		
Thailand	X		X	X	X				X	X	X	X	
Sri Lanka	X	X		X	X			X			X	X	X
China	X	X			X				X	X	X	X	X
Philippines	X	X		X	X				X	X	X	X	X
Indonesia	X	X		X	X			X	X	X	X	X	X
Malaysia				X					X				
Taiwan	X		X					X			X	X	
Nigeria			X										
South Africa	X		X	X	X			X	X	X	X		X
Tanzania	No EIA Procedure in Place												

amongst the various government departments involved in planning, development and environmental conservation.

Having identified various procedural weaknesses and constraints to effective EIA implementation, one could expect its utility and effectiveness as a tool - to further or achieve the goals of CZM - also to be limited. Whilst there was very little literature which commented on this subject, it is the author's view that this is in fact the case.

Firstly, much of the literature advocating the use of EIA as a strategy for coastal management, emanates from the USA and focuses primarily on its application as a mechanism to regulate development activities in the coastal zone. The emphasis is on the production of an EIS and its contribution to decision-making of specific projects on an *ad hoc* basis. Even the Coastal Commission's response to issuing permits in the Californian coastal zone has been criticized for adopting a "permit by permit approach" rather than a broad, holistic approach (Grenell, 1991). Such an approach does not address cumulative impacts; cannot respond to regional issues and concerns; and will not ensure long-term sustainable multiple use of the coast. In addition, conducting impact assessments at the project level does not achieve economics of scale (Sorensen and West, 1992). The more efficient and cost effective approach would be to undertake project EIA's within the broader context of coastal area policies and plans which have been informed and shaped by environmental considerations and community concerns. In this regard, the proposals put forward by Burbridge et al. (1989) that a balanced environmental assessment of coastal resource systems be undertaken prior to the formulation and review of specific developments merits serious consideration. Such an assessment would provide information regarding the capabilities of the environment to support different types and levels of development, and would effectively restrict the undertaking of EIA's to those projects which would exceed the carrying capacity of the system. Gamman and McCreary (1988) have suggested preparing a Master Environmental Assessment, on a regional basis, as a means to strengthen the practice of EIA in the Caribbean region, whilst Sorensen and West (1992) advocate the preparation

of a system wide coastal plan, as a means of reducing the numbers and costs of project EIA's.

Adoption of these proposals would certainly enhance the effectiveness of EIA as a tool for CZM. However, it is the author's view that the development of guidelines, based on case study material, which provides information on how EIA principles and procedures can be incorporated into coastal planning, programme and policy formulation and assessment is urgently required. The theory exists, but guidelines based on practical experience of integrating EIA into plan, programme and policy making are lacking.

Another key factor limiting the effectiveness of EIA within CZM-type programmes, is the lack of co-ordination and communication within and amongst the various government departments and sectors involved in CZM efforts, economic development and environmental conservation. Furthermore, the interests and status of the various agencies responsible for implementing aspects of CZM, and those reviewing EIA's of projects affecting coastal resources, may differ widely. Strong sectoral departments may be unwilling to incorporate recommendations of other departments.

Even in a country such as the Philippines, where an inter-governmental organisation comprising heads of various agencies has been established to review EIA's, individual Ministries - whose role is that of "responsible agency" - may not heed recommendations of the review committee, or may ignore requirements to undertake EIA's (Lim, 1985). In other countries, such as Malaysia and South Africa, the proponent or initiating agency may also be the final decision-making authority. In the absence of clear review and appeal procedures, the findings and recommendations of the EIA may simply be ignored. Clearly, the ability of EIA to further the goals of CZM under these circumstances are curtailed.

The establishment of an agency (either a new or modified existing agency) with overall CZM responsibilities, as well as regulatory and EIA review functions, is the

type of institutional arrangement which could facilitate the effective use of EIA as a strategy for coastal zone management. Several coastal programmes in the USA have achieved a measure of success by incorporating a project review function within the responsible CZM agencies. The structure and functions of the Coastal Conservation Department (CCD) in Sri Lanka are similar to many coastal agencies responsible for CZM programmes in the United States. One of the criteria employed in the project appraisal and review process is whether the project is consistent with coastal resource management policies and objectives. This should be an essential first consideration in the planning and assessment of all projects affecting the coastal zone, if EIA is to serve the goals of CZM.

Whilst the structure and function of the CCD facilitates the employment of EIA in principle, Premaratne (1991) claims that the system has failed to regulate undesirable development activities in the coastal zone. This he attributes to the lack of public support, a complex permit approval system, and most importantly, the failure to take cognisance of existing local institutional arrangements as well as social and cultural systems. This does not negate the appropriateness of CCD's institutional arrangements, but suggests that the process of establishing such a co-ordinating agency and assigning functions to it must be undertaken in a participatory manner and informed by local institutions, socio-economic needs and cultural norms.

## CONCLUSIONS

Throughout the CZM literature reference is made to the use of EIA as an important strategy to implement CZM-type programmes. The rationale for advocating its use is based on the assumption that the application of EIA should lead to a more sustainable use and development of coastal resources and areas - fundamental goals of CZM. Yet, a closer examination of the effectiveness of EIA in furthering the goals of any CZM effort or programme, revealed that it is performing a limited role. Some of the reasons for this poor performance can be traced to procedural and methodological inadequacies within the EIA process itself. However, CZM theorists

attribute its limited effectiveness to political constraints, institutional shortcomings, inadequate training programmes and limited resources, expertise and data.

Whilst these factors are certainly restricting the benefits that should be gained from undertaking EIA's, it is the author's view that what is required to improve the effectiveness of EIA as a strategy to enhance CZM efforts, is a fundamental change in approach to EIA. There is a need to move away from a strict compliance with a set of procedures, as required by legislative control or administrative directive to a better understanding and broader application of, and commitment to, the key principles underpinning EIA. To recap the key principles are:

1. Full disclosure of information relevant to the proposed action, its impacts and implications;
2. Effective involvement of the public throughout the planning, assessment and decision-making process;
3. Consideration of alternative courses of action to meet the stated need of the proposal;
4. Integration of environmental considerations and community concerns throughout the planning and decision-making process;
5. Accountability for decisions taken;
6. An iterative process involving feedback of EIA findings and modifications to the planning and design stages.

These principles should not only guide the assessment of development projects but should be integrated into the planning, assessment and decision-making process of all policies, programmes and plans likely to impinge upon coastal resources and areas. This does not undermine the need for project-specific EIA's which will

continue to be required for projects affecting the coastal zone. However, in the absence of a broader policy and planning context, and without knowledge of the potentially competing resource uses for the area, as well as coastal users' aspirations and values, it would be difficult to assess the significance of impacts associated with individual projects. Undertaking project EIA's within the broader context of coastal area policies, programmes and plans, which have themselves been formulated following the principles and procedures of EIA, will not only be more cost effective, but will also strengthen the effectiveness and practice of EIA within CZM programmes.

Whilst adherence to these key principles cannot ensure environmentally sound planning and decision-making, it requires that the issues, alternatives, uncertainties and trade-offs be brought into the public arena. Under these circumstances it becomes more difficult for professionals and decision-makers to ignore environmental and community concerns and thus accountability for decisions is promoted.

Finally, for EIA to support and serve the goals of CZM, coastal managers, communities and user groups will need to be adequately informed, appropriately trained, empowered and thus enabled to participate in CZM efforts. Furthermore, appropriate, representative and accountable institutional arrangements must be set in place to co-ordinate the various CZM efforts.

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## PAPER 2

# THE STATUS OF COASTAL ZONE MANAGEMENT IN SOUTH AFRICA\*

### INTRODUCTION

The South African coastline, approximately 3000km in length, extends from the semi-arid Namibian coast in the north-west, to the sub-tropical Mocambique border at Ponta do Ouro in the east (Figure 1). The diverse environmental characteristics and conditions found along the coast, largely due to the influence of the Indian, Atlantic and Southern Oceans (Branch and Branch, 1981, Heydorn et al., 1985), have influenced human settlement patterns and land-use activities in the coastal zone.

Historically, much of South Africa's population and economic activity has been concentrated inland, but in recent years the coastal zone has been subjected to increasing development pressure. This is particularly evident in the four major coastal cities of Cape Town, Port Elizabeth, East London and Durban which are experiencing rapid growth (Coetzee and Geldenhuys, 1989).

Several factors are contributing to the increased pressure in the coastal zone. These include the rapid population growth rate of approximately 2.3% per annum and the abolition of restrictive Apartheid policies which previously denied access to the majority of South Africans to certain areas, resources and facilities in the coastal zone. Furthermore, the process of urbanisation, and in particular the development of informal settlements on vacant land within coastal urban areas has placed enormous strain on natural resources and infrastructural services (Retief et al., 1991), as well as exacerbated urban environmental problems.

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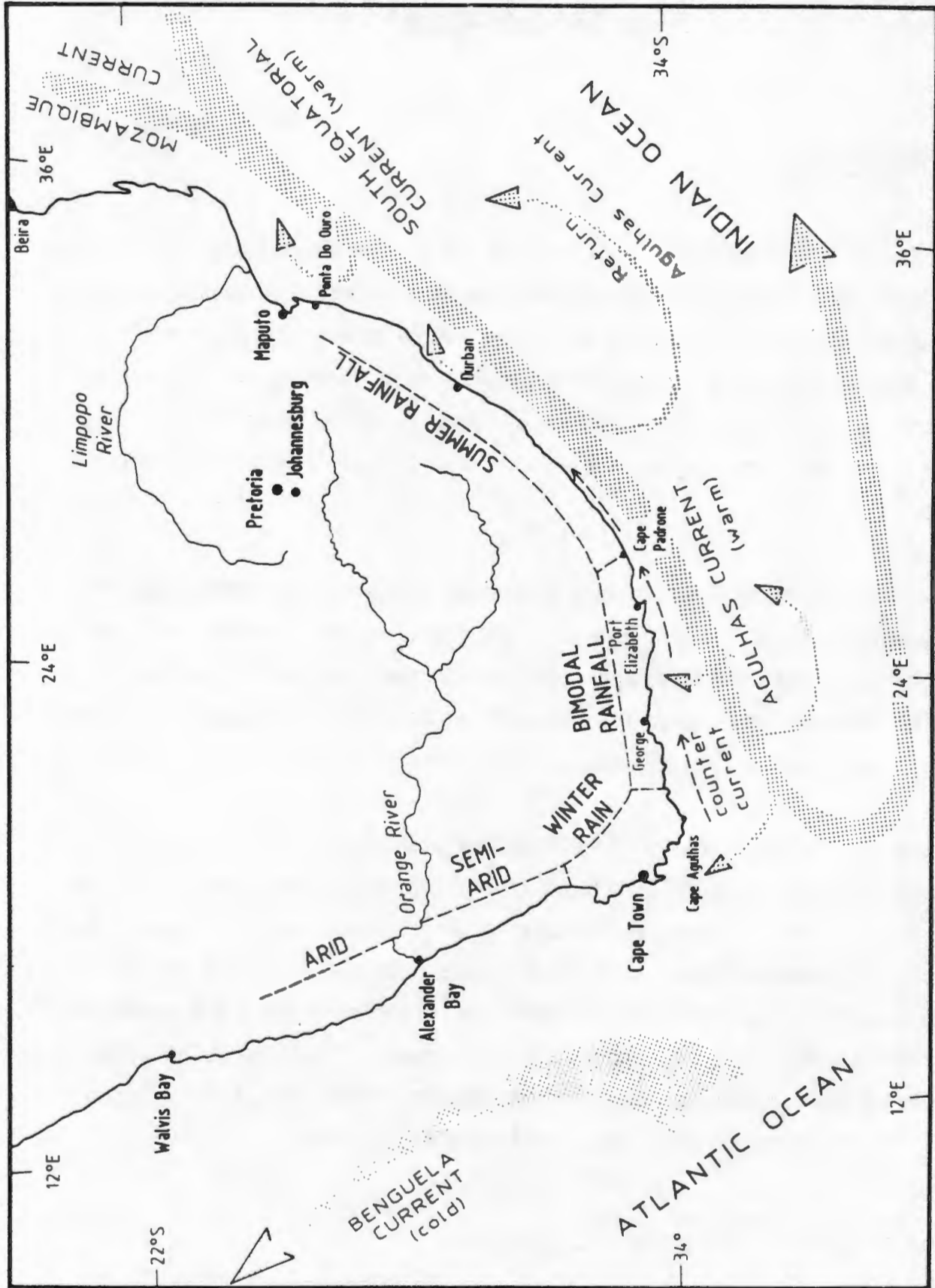


Figure 1. Characteristics influencing South Africa's Coastal Environment

In addition to the above pressures, demand for land for holiday housing and recreational development in the coastal zone is increasing (Sowman, 1990). Recent socio-political changes have also had a positive impact on tourism (Heath SATOUR 1992, pers. comm.). The revitalisation and expansion of this industry is dramatically altering sections of South Africa's unspoilt coast. The inappropriate siting of infrastructural developments such as dams and roads has also degraded coastal ecosystems.

While economic growth and development in the coastal zone are essential to meet the basic needs of the poor and the demands of the more affluent sectors of the population, such activities have proceeded in an ad hoc, unco-ordinated and exploitative fashion. This approach has resulted in conflicts over coastal uses and the degradation of coastal resources.

In the late seventies, an increased awareness amongst certain coastal managers and government departments of the enormous ecological and economic value of the coastal zone, and the realization that a comprehensive and co-ordinated approach to coastal zone management was required, led to the formation of a coastal unit within the Department of Environmental Planning and Energy (now the Department of Environment Affairs) (Figure 2). At the same time, Provincial authorities and quasi-governmental institutions, such as the Council for scientific and Industrial Research, also began co-ordinating and strengthening their coastal zone management efforts.

These initiatives were certainly influenced by renewed involvement of South African academics, managers and government officials in international conferences and events concerned with coastal zone management.

Since the early eighties, considerable progress has been made in the area of coastal zone management (hereafter CZM) in South Africa (Heydorn et al., 1985; Coetzee and Geldenhuys, 1989; Retief et al., 1991). In particular, the activities of the Committee for Coastal and Marine Systems (CCMS) (see Figure 2), a sub-

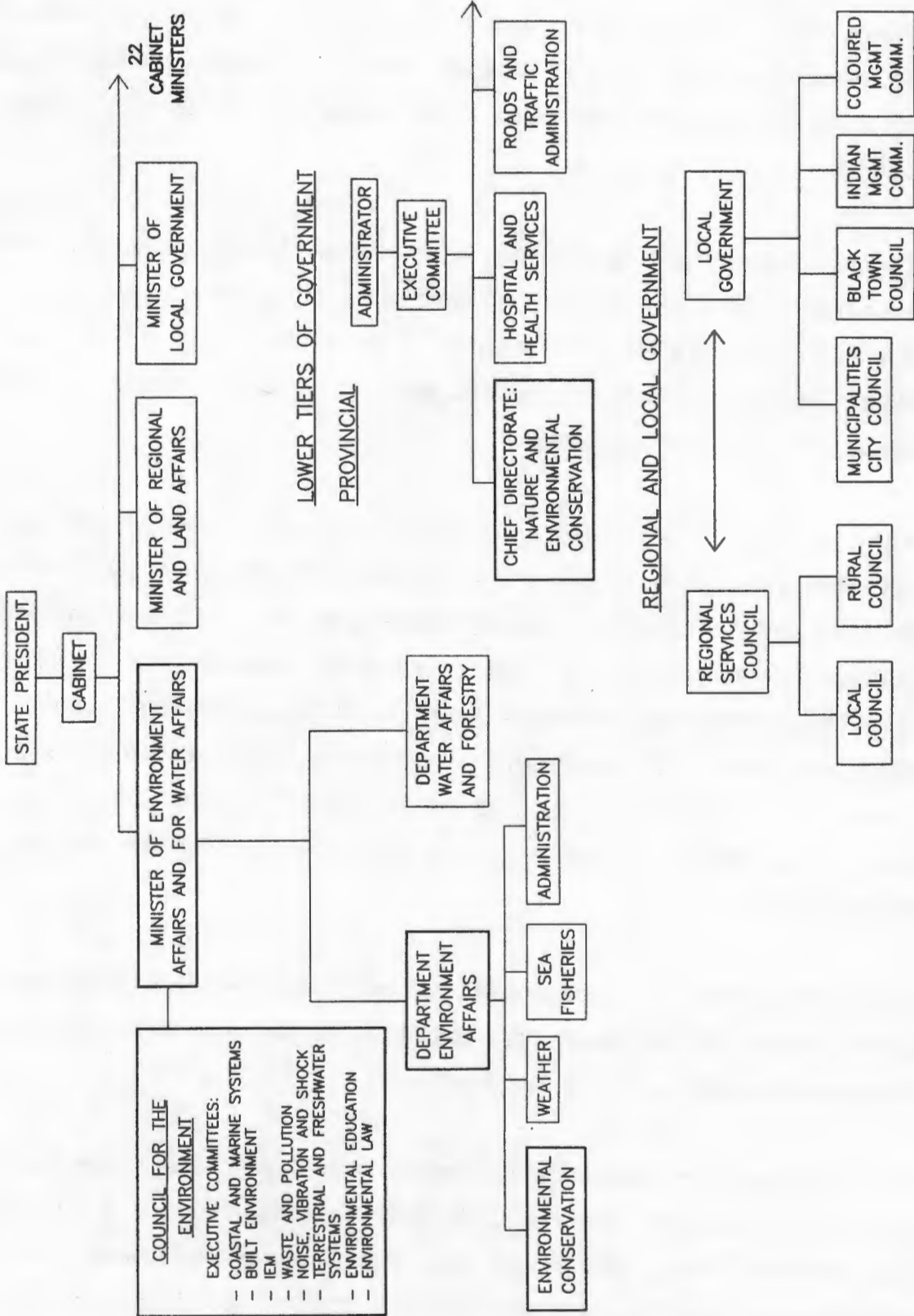


Figure 2. Government Structures Relevant to Coastal Zone Management in South Africa

committee of the Council for the Environment - which was established in terms of the Environment Conservation Act 100 of 1982 (now repealed and replaced by Act 73 of 1989 of the same name) to advise the Minister on all matters affecting the environment - have heightened awareness of the value of coastal resources and the need to afford it special management attention. However, as yet there is no comprehensive, integrated coastal zone management system in place.

The purpose of this paper is to review the status of CZM in South Africa, report on progress, identify areas still requiring attention, and recommend ways of improving the co-ordination and implementation of efforts.

## A FRAMEWORK FOR ASSESSING THE STATUS OF CZM IN SOUTH AFRICA

A broad brush review of CZM efforts in both developed and developing countries reveals that most CZM programmes have been developed in response to crises (Clark, 1991). Different aspects of CZM have been developed and implemented in different countries depending upon the problems requiring attention. For example, the system of project assessment and development control is particularly well developed in Sri Lanka (Sri Lanka Coast Conservation Department, 1990) while management strategies to protect the coast from natural hazards is the focus of the Netherlands CZM system (Koekebakker and Peet, 1987).

While there is no universal model for CZM (CAMPNET, 1989) the above review suggests that any comprehensive, integrated CZM programme should embrace the following components:

1. An overall policy statement which determines the nature and direction of any decisions, actions or other matters which may impinge upon the coastal environment. Such a policy would define the terms coastal zone and coastal zone (or resource) management, lay down principles for CZM, and set overall

goals and more specific objectives to guide activities and decisions affecting the coast.

2. A management strategy which indicates how stated goals and objectives may be achieved. Management strategies employed range from legislative provisions and administrative procedures to more specific tools such as sensitivity maps and guidelines within the categories listed below.
  - (1) Coastal land-use planning.
  - (2) Project review and environmental assessment.
  - (3) Resource conservation and management.
  - (4) Pollution control.
  - (5) Coastal environmental education and awareness.
  - (6) Public participation.
  - (7) Research and information.

(Fisheries management is not usually included in CZM programmes and is either independently handled or left to other management programmes such as economic development).
3. Institutional arrangement for the implementation of the policy statement and management strategy. Implementation should occur either within the existing legal and administrative framework or by modifying or developing new legislation and administrative structures.
4. A system to evaluate the extent to which the coastal zone management programme is achieving its policies and objectives.

The status of CZM in South Africa will now be reviewed within this framework. Mechanisms for implementing CZM efforts will be discussed when reviewing progress in respect of policy and management strategies.

## REVIEW OF CZM IN SOUTH AFRICA

### Policy for CZM

On promulgation of the now repealed Act 100 in 1982, the Department of Environment Affairs (DEA) considered the formulation of a policy for CZM a priority. This task was assigned to the CCMS, one of a number of committees established to assist the Council for the Environment advise the Minister of Environment Affairs regarding environmental policy and related matters (Figure 2). It was envisaged that the policy document would comprise three parts: Part 1, dealing with Principles and Objectives for CZM; Part 2 giving "Guidelines for Coastal Land-use", and Part 3 presenting an "Integrated Coastal Management Plan" for South Africa. Part 1 and 2 of this series have been published.

In Part 1, the coastal zone is defined as "a system with open boundaries which may include estuaries, onshore areas and offshore areas wherever they form an integral part of the coastal system" (Council for the Environment, 1989a). While this ecological definition provides for interactions between land and sea in its widest sense and recognises the need for protection of natural processes which govern such interactions, it is problematic when it comes to implementation. Consequently, both coastal provinces, namely Natal and the Cape Province (but not the so-called homelands Ciskei and Transkei), were charged with the task of delineating the inland boundary of the coastal zone using existing cadastral boundaries, such as main roads and farm boundaries, which best incorporated coastal ecosystems and features. It was recommended that the seaward boundary be set at 3 miles (or 5km). To date, there is still no definition of coastal zone in the South African legislation and debate over both the landward and seaward boundary continues.

In this same document, CZM is defined as "the effective conservation and utilization of the coast as a dynamic ecosystem at the interface between the land and sea." The overall aim of CZM is to ensure that development in the coastal zone, which should be regarded as a common heritage of the nation, is regulated in such a way

as to benefit the greatest number of people possible, while at the same time safeguarding the intrinsic environmental features and ecological processes of the coast.

The principles and objectives outlined in Part 1 of the Policy document are mainly concerned with protection and conservation of coastal resources and areas, and the integration of ecological considerations into the planning and development process. However, principles and objectives dealing with socio-economic and political issues, such as encouraging sustainable economic development, improved access to coastal resources, and public involvement in planning and decision-making, have not been addressed. Any comprehensive CZM policy would have to address these latter issues especially in South Africa where socio-political changes demand that economic development be positively encouraged.

Part 2 of this series, "Guidelines for Coastal Land-use" (Council for the Environment, 1991), provides guidelines for the planning, development and management of various components of the coastal environment. Rather than providing policy direction, these guidelines serve as a practical tool for developers, planners and decision-making authorities, since they assist in tasks such as forward planning, site analysis and project appraisal. As such, those guidelines should be considered as part of a strategy to achieve the aims of CZM, not as policy.

Recently, the Council for the Environment and the DEA have recognized the problems associated with their approach to policy formulation. Consequently, the DEA appointed consultants to facilitate the preparation of a discussion document on coastal resource management to aid the process of policy formulation (Kapp Prestedge Retief, 1992).

Thus it can be seen that while aspects of policy have been developed, there is as yet no overall integrated CZM policy. The development, acceptance and adoption of such a policy is a fundamental component of any integrated CZM programme.

Without policy, even clear and implementable management strategies will not be effective.

### **Strategies to Achieve CZM**

While many of the first important actions in coastal conservation and management started with the creation of coastal reserves and protected areas, a more comprehensive strategy is required if our aim is to achieve the conservation and sustainable use and development of coastal resources. In this section, a review is given of the progress made with the development and implementation of a variety of strategies to achieve the aims and objectives of CZM.

(1) *Coastal Land-use Planning*: While national planning legislation exists, urban and regional planning in the South African coastal zone is largely the responsibility of the Provincial Administrations and local authorities (Figure 2) and is regulated by the various Town Planning Ordinances. There are two different ordinances which govern land-use planning in the coastal provinces of Natal and the Cape. The Town Planning Ordinance 27 of 1949 governs planning in Natal, and in the Cape, the Land Use Planning Ordinance 15 of 1985, replaced the former Townships Ordinance 33 of 1934. Until fairly recently the principle vehicle for planning and land-use control was the town planning scheme (now zoning scheme in the Cape). Town planning is concerned mainly with promoting the co-ordinated and harmonious development of a demarcated area, in order to secure an adequate living environment, through the provision of services and protection of public health. The general purpose of schemes, which only apply to urban areas, is to indicate for what purpose land may be legally utilized, and through scheme regulations, determine the manner and scale of development that may be permitted in each zone.

Town planning schemes indicate how development should proceed in a particular area and as such are a form of development control which should serve the interests of environmental conservation. However, this is not necessarily the case. Firstly, town planning schemes are only applicable in towns and cities and secondly,

most schemes were compiled when awareness of environmental issues was limited so that many inappropriate zonings were granted which still persist today. Such zonings granted development rights which cannot be withdrawn without compensation. Inappropriate developments in many coastal towns are largely due to inappropriate historical zoning patterns. In the Cape, zoning rights persist for 15 years and, if not utilised within this period, will lapse unless an extension is granted. In Natal, on the other hand, zonings exist in perpetuity.

Should a landowner wish to utilize land for a purpose which does not conform with the zoning scheme, an application must be made to rezone the land. Whilst administrative procedures exist to review such applications, they are deficient in terms of environmental considerations, public concerns and accountability for decisions taken (Sowman 1988). (This will be elaborated on in the next section which deals with Project Review and Assessment).

Whilst the intention of the original Town Planning Ordinances was to achieve both development control and forward planning through the town planning schemes (Claassen and Milton, 1992), the emphasis of these schemes was on land-use control, not forward planning. In the mid-eighties, the system of forward planning was greatly improved in both coastal provinces with the introduction of structure plans. A structure plan does not confer or withdraw rights but sets out development policy for a town, urban area or sub-region. Its purpose is "to lay down guidelines for the future spatial development of an area to which it relates (including urban renewal, urban design or the preparation of development plans) in such a way as will most effectively promote the order of the area as well as the general welfare of the community concerned" (section 5(1) Ordinance 15 of 1985). A structure plan usually comprises a written report illustrated with maps and plans, indicating only broadly and conceptually the form that future development should take, and the areas to be conserved. Provision is made in the Ordinance for the involvement of the public in the preparation of the structure plans.

A series of sub-regional coastal structure plans has been prepared by the Cape Provincial Administration. While these planning documents provide a broad picture of potential land-uses and levels of development for various coastal regions, their focus is on identifying land for various types of recreational development and conservation purposes. As such they are not comprehensive forward planning documents since they fail to address complex issues such as rapid urbanisation, the settlement of informal communities in coastal areas, and economic growth requirements. A further limitation is that the planning is orientated towards the landward side of the high water mark and little attention has been given to planning-related issues in the adjacent coastal and estuarine waters, such as zoning for recreational uses. In addition, the potential impacts of certain land-based development proposals on coastal waters are not always considered. However, despite these limitations the coastal structure plans are a valuable tool to planners, developers and decision-making authorities, especially when assessing the suitability of development proposals.

In addition to the coastal structure planning process, another regional planning system exists which impinges upon coastal planning. This is referred to as the regional development approach and is mainly concerned with formulation of development policy for the nine development regions of South Africa, including the self-governing territories and the independent states. The process is facilitated by a hierarchy of mostly voluntary committees and associations which seek to identify and resolve opportunities and constraints for socio-economic development in their region and advise the government accordingly. Whilst aspects of the regional development approach, such as the communication of local problems, are to be encouraged, it has been criticised as a cumbersome structure and its contribution to real development has been queried (Claassen and Milton, 1992). The lack of integration of socio-economic development issues and policies into the coastal structure plans suggests that there is very little co-ordination between these two planning efforts.

Superimposed on the above-mentioned regional and local planning systems is the National Planning System which is now largely the responsibility of the Department of Regional and Land Affairs (Figure 2). A review of the legislative framework governing national planning since 1947 reveals that national planning has been haphazard (Claassen and Milton, 1992; Kapp Prestedge Retief, 1991), its purpose has been unclear and its utility to resource planners and managers has been minimal due to its focus on orderly physical planning and more recently on economic planning.

National planning efforts of relevance to the coastal zone have been the preparation of statutory guide plans for certain coastal areas prepared under the now repealed Physical Planning Act 66 of 1967. However, these guide plans are concerned with the physical ordering of land and fail to adequately incorporate environmental considerations. Of concern is the fact that the new Physical Planning Act 125 of 1991, instead of adopting a more holistic, resource-orientated approach to planning, focuses on orderly physical planning at all levels of government. It also provides for a hierarchy of plans from broad policy plans at a national and regional level to more detailed land-use plans at the urban level. There is no mention of the coastal zone as a distinctive component of the broader environment, requiring special attention.

In addition to the planning systems discussed above, there are various other planning activities by government departments (e.g. Transport and Environment Affairs) which impinge on coastal planning efforts. The key problem is that the various planning efforts - whether they relate to transportation, economic growth, agricultural development or recreational use - are not co-ordinated and little cognisance is given to the environmental implications of planning proposals. Since the planning system does not regard the coastal zone as a distinctive area requiring special attention, national and regional planning proposals affecting coastal areas, may not be consistent with the principles and objectives for coastal zone planning and management.

Recognising the inadequacies within the existing planning system to deal with the increased population and socio-economic pressures in the coastal zone, the COAST (Coastal Action Strategy) project was initiated in 1990 (Kapp Prestedge Retief, 1990a). The aims and objectives of this project are discussed under the section dealing with current initiatives.

(2) *Project Review and Environmental Assessment*: A fundamental element of most CZM-type programmes is a system to review development projects impacting coastal resources (Clark, 1988; Clark, 1991; Sri Lanka Coast Conservation Department, 1990; Sorensen and West, 1993). In certain countries this has been expanded to include the review of policies, programmes and plans which may affect the coastal environment. Most of these review systems incorporate the principles and procedures of Environmental Impact Assessment (EIA). The purpose of EIA is to ensure that the environmental impacts and implications of development proposals are identified and assessed, thereby informing the planning and decision-making process.

In South Africa various forms of development activities, including the establishment of townships, sub-division of land and rezoning of land, have to comply with administrative procedures in terms of legislation, before a proposal is approved, approved subject to conditions, or rejected. However, there is at present no legislative requirement that a formal EIA be undertaken. As mentioned in the previous section, appropriate planning and development in the coastal zone is constrained by development rights entrenched by zoning.

Where a proposal conforms with the zoning, even if environmentally inappropriate, permission to proceed is usually granted, since compensation for lost rights in the coastal zone would be very costly. Such proposals need only conform with the building regulations which are also deficient in terms of environmental considerations, since they omit, among other things, provisions to regulate the location of developments on a particular site.

However, many development proposals require that the proponent apply for a rezoning of land. While informal procedures exist to assess the desirability of such proposals, they are inadequate (Sowman, 1988). Applicants are requested to submit only limited bio-physical information pertinent to the site and there is no requirement to consider alternatives, or to identify and assess the environmental impacts of development activities. Although legislative provisions exist which could be utilized to request additional environmental information or even that an EIA be undertaken, this is at the discretion of the decision making authority. In cases of highly controversial development projects decision-makers may require the proponent to submit an EIA.

The assessment of projects is largely based upon the comments received from responsible and affected government departments. These include the provincial departments of Nature and Environmental Conservation, whose comments are limited to how the project may affect the bio-physical environment. Few Government departments have the expertise to comment on the social, economic, cultural and aesthetic effects of development proposals.

Of concern is that there is no legislative requirement that the comments received are incorporated into the decision-making process. There are several examples where advice regarding environmental suitability of a proposal has been sought from specialists and then been ignored (Sowman, 1988). Opportunity for public involvement in the decision-making process is also inadequate since participation is by objection and only requested once the proposal is in the final planning stages. Even where public comment is sought, the legislation does not always oblige the administrative body concerned to consider the comments received.

The devolution of power and lack of expertise at local authority level, especially outside metropolitan areas, are further issues of concern. In addition, many local authorities regard economic growth and development to be advantageous since the salaries of officers are linked to the rates base they administer. This leaves the system open to abuse. While a system of appeal exists, whereby the proponent or

an affected party may appeal against a decision, the lack of formal procedures for assessing the environmental impacts of a proposal, as well as the absence of clearly defined criteria for the refusal or approval of applications, raises questions regarding the efficacy of the appeal procedure. Finally, decision-makers are not accountable to the public.

There are a number of useful tools which could aid the assessment and review process. These include the Principles and Objectives for CZM (Council for the Environment, 1989a), Guidelines for Coastal Land-Use (Council for the Environment, 1991), Coastal Sensitivity Maps (Theunissen and Heinecken, 1989), Coastal Structure Plans (CPA, 1988), Water Quality Criteria for the Coastal Zone (Lusher, ed., 1984) and Guidelines for Locating Small Craft Facilities Along the South African Coast (Retief, 1986). However, the lack of statutory procedures for project assessment and review means that these guidelines and principles will only be employed by enlightened decision-making authorities.

An attempt to promote environmentally sound development practices in the coastal zone was made by promulgating the Coastal Regulations of 1986 in terms of the repealed Environment Conservation Act 100 of 1982. In terms of these regulations, a permit was required by any person wishing to undertake an activity on coastal land situated within 1000 metres of the high water mark. A list of activities subject to these regulations was provided and permits could only be issued once the environmental consequences of the proposed activity had been considered and assessed. However, not long after their promulgation, these regulations were rescinded because of administrative and legal inadequacies (Rabie, 1987; Sowman and Glazewski, 1987).

Efforts, by an inter-departmental working group, to identify and introduce an effective replacement mechanism to the Coastal Regulations in terms of the new Environment Conservation Act 73 of 1989, are currently underway (see section on current initiatives).

Control over development below the high water mark is regulated by provisions in the Sea-Shore Act 21 of 1935. Only development activities which are considered to be in the public interest will be permitted. However, here again, there are no formal procedures or criteria for assessing the merits of such proposals and inevitably inappropriate developments are approved.

In order to address the inadequacies in our current project review and assessment system, a procedure entitled Integrated Environmental Management (IEM) has been developed. IEM is discussed in greater detail in the section on current initiatives.

(3) *Resource Conservation*: This section examines the progress that has been made with regard to the conservation of coastal resources.

Coastal resource conservation implies the wise management of renewable resources, including natural systems (such as estuaries and wetlands), species (such as rock lobster), as well as non-living resources (such as heavy mineral deposits), within an area defined as the coastal zone.

These natural resources may also be regarded as scenic resources (such as a feature of outstanding beauty), recreational resources (a beach or water body), historic, cultural or scientific resources, and as such, require conservation action to ensure their sustainable use and development.

Considerable progress has been made with regard to conservation of coastal ecosystems and species through the establishment of a network of national parks, nature reserves and to a lesser extent marine reserves. In fact, South Africa has developed a very strong and internationally respected tradition in terms of the establishment and scientific management of their protected areas (Botha and Huntley, 1989). A plethora of national statutes and provincial ordinances exist which provide for the establishment and management of coastal conservation areas. These include National Parks, provincial nature reserves, marine reserves, private nature

reserves, lake areas, forest nature reserves, wilderness areas, nature areas and islands.

A number of Marine reserves and sanctuaries have been proclaimed which protect designated species or complete habitat. According to Hockey (1989), 23,3% of South Africa's coastline falls within National Parks, nature reserves and marine sanctuaries and reserves. Of concern, is that with the exception of the Tsitsikamma Forest and Coastal National Park and Langebaan West Coast National Park, conservation areas in the coastal zone do not extend seaward below the high water mark. Since the focal area of coastal conservation is the land/sea interface, exclusion of the 'wet side' of the coastline in many of these conservation areas, represents a major shortcoming in conservation efforts. Given that the sea and shore are owned by the state, expropriation for conservation reasons could be achieved at a reasonable cost (Hockey, 1989). Delegation of power to provincial authorities to enable them to protect the sea-shore within nature reserves (Hockey and Buxton, 1989) or to extend terrestrial seawater mark of reserves would considerably improve the conservation status of the South African coastal zone.

It has been recognised that the current network of coastal and marine reserves is inadequate (Robinson et al., 1985; Hockey, 1989; President's Council, 1991). A preliminary investigation, by a working committee of the Council for the Environment, identified certain relatively untransformed natural areas within the coastal zone which merit consideration as areas for special protection (Robinson et al., 1985). As yet, no overall proposal or plan of action to secure and protect these areas has been put forward. The recently published President's Council Report (1991), which reviews the status of environmental management generally and makes recommendations on a policy for a national environmental management system for South Africa, recommended that the status of the present coastal and marine reserves be reviewed, with a view to making recommendations for strengthening their conservation status.

The major mechanism for controlling the utilization of coastal living resources outside protected areas is through various legislative provisions. The Sea Fishery Act 12 of 1988, and its accompanying regulations, imposes various forms of control over all fishing activities, including the exploitation of intertidal shellfish and bait organisms. Exploitation of aquatic plants in the sea and on the sea-shore is also regulated by regulations issued in terms of this Act. In Natal, the Natal Parks, Game and Fish Preservation Ordinance 35 of 1947 (which replaced the Sea Fisheries Act) and the Natal Fisheries Licensing Board Regulations (issued in terms of Ordinance 15 of 1974), regulate exploitation activities by setting bag limits, size limits and closed seasons (Hockey & Buxton, 1989). The Nature and Environment Conservation Ordinances in the Cape and Natal also restrict utilization of both plant and animal resources in coastal areas, including tidal lagoons, tidal rivers and estuaries.

There is other legislation which contributes to coastal resource conservation. For example, the Conservation of Agricultural Resources Act 43 of 1983 makes provision for the utilisation and protection of vleis, marshes, water sponges, water courses and water sources. The Lake Areas Development Act 39 of 1975, regulates fishing activities in lake areas and through provisions - aimed at control of land adjacent to tidal waters, natural lakes or rivers - contributes to the maintenance of water quality in such systems. There are provisions in the Mountain Catchment Areas Act 63 of 1970, the Water Act 54 of 1956 and the Forest Act 122 of 1984 which regulate certain injudicious land-use practices, such as the overabstraction of water from rivers, which may degrade coastal ecosystems.

While a plethora of legislation exists to enable authorities to establish protected areas and to control utilization of certain coastal resources, the effectiveness of this legislation depends upon its enforcement. With our vast coastline, resources (including funds, personnel and equipment) available for law enforcement are hopelessly inadequate. Where effective enforcement is absent, the sanctions supplied by these provisions are of little, if any, consequence (Bothma and Rabie, 1983).

A further problem, preventing effective conservation of coastal resources, is the lack of co-ordination of the many activities amongst various departments involved in administering the plethora of legislation applicable to coastal conservation. This has been exacerbated by the homelands policy which has resulted in a separate legal and administrative system for the Ciskei and Transkei coastal zone. However, with the changing political circumstances in South Africa, it is likely that the areas will be reintegrated into South Africa in the near future.

One of the major shortcomings in coastal resource conservation has been that the focus outside reserves has been on protection of individual species rather than on ecosystems and habitats. The legislation does not recognise coastal ecosystems as integrated dynamic systems in need of an holistic approach to planning and management. This shortcoming is linked to the lack of an overall policy guiding CZM efforts in South Africa.

Despite the problems outlined above, efforts to conserve coastal living resources in South Africa are considered to be relatively good (Hockey and Buxton, 1989). However, the conservation of coastal resources in terms of their recreational, scenic, educational, scientific, historic and cultural value is extremely limited. While the War Graves and National Monument Act 28 of 1969 makes provision for the proclamation of any movable or immovable property of aesthetic, historical or scientific value as a national monument, it has been used mainly to protect wrecks and their cargos (Heydorn et al., 1992). Greater efforts to conserve coastal resources for these values must be made.

Exploitation of non-living coastal resources includes, for example, mining of heavy minerals in dune sands, as well as diamonds and other precious stones found mainly in the sand dunes and off-shore areas of the West Coast. Whilst the exploitation of oil and gas resources off the Southern Cape coast does not directly impact on coastal resources, impacts associated with the development of infrastructural services and facilities, required to exploit these resources, does result in degradation. The potential impacts associated with the damming of the Great Brak

River (Council for Scientific and Industrial Research, 1990) is one example of how coastal resources may be affected by off-shore exploitation activities.

Recognising the degradation that has resulted from prospecting activities and mining operations country wide, the Chamber of Mines commissioned the preparation of a series of handbooks providing guidelines for environmental protection when undertaking mining activities. Whilst not entrenched in law, the adoption of these guidelines has, at the very least, created an awareness in the industry of the need to take cognisance of environmental considerations in the planning, development, management and decommissioning of mining operations.

Legislation relevant to prospecting and mining, namely the Minerals Act of 1991 takes cognisance of the environment in that it requires rehabilitation plans to be prepared and approved. However, there is no legal provision which requires that an EIA of a proposed activity be undertaken. This shortcoming is partly being addressed by the recently accepted proposals which require mining industries to submit an Environmental Management Programme Report (EMPR) for review prior to commencement of a project (Wells et al., 1992).

However, lack of statutory requirements to take environmental considerations into account in the planning, development, management and decommissioning phases of mining activities remains an area of concern, especially as pressure to mine heavy minerals in dune ecosystems is increasing. The anticipated implementation of IEM (see section on Current Initiatives) may go a long way to improving the situation.

(4) *Pollution Control*: Oil, from maritime activities, and organic pollution, mainly from land-based activities, are considered to be the most serious pollution threat to coastal ecosystems (Hockey, 1989). Other forms of pollution - such as heavy metals, radioactive substances, plastics, pesticides and thermal pollution - although harmful to marine life, pose less of a threat (Branch and Branch, 1981, Hockey,

1989). In this section, the assessment will focus on strategies that exist to control pollution from oil spills and land-based activities.

Recognising the threat posed by vast numbers of tankers transporting oil around the South African coast annually, a Coastal Sensitivity Atlas was compiled (Jackson and Lipschitz, 1984). This atlas identifies priority areas for protection from oil spills, based on their environmental sensitivity, as well as their biological and socio-economic importance. Using this information, Oil Spill Contingency Plans (Unpublished Reports, DEA) to deal with such pollution events in the various coastal regions have been prepared. Already these tools have proved most valuable in dealing with oil pollution problems. The Pollution Control Division of the Sea Fisheries Research Institute (SFRI), within DEA (Figure 2), is responsible for co-ordinating activities associated with oil spills and has at its disposal sophisticated equipment to assist them in this task.

In addition to these strategies, provisions exist in our legislation to minimise oil pollution from operational discharges and accidental spills and to set out rules for liability once pollution has occurred. The main statutes dealing with oil pollution are the Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981 (PACOPASOA), the International Convention for the Prevention of Pollution from Ships Act 2 of 1986 (known as the MARPOL Act), and the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Act 64 of 1987. These laws have been influenced by, and incorporate aspects of, certain international marine pollution conventions to which South Africa is a party (Heydorn et al., 1992). Implementation of the legislative controls dealing with prevention of oil are largely the responsibility of the Department of Transport while the SFRI within the Department of Environment Affairs, is responsible for administering sections of these Acts, covering issues arising once pollution has occurred.

While mechanisms exist to regulate activities which result in oil pollution, effective control is hampered by a number of administrative and legal problems. Firstly, the MARPOL Act is not effective since the Minister of Transport has not yet promulgated

regulations to give effect to this Act (Field and Glazewski, 1992). In addition, there is a measure of duplication of provisions found in the MARPOL Act and PACOPASOA. It has therefore been recommended that the issues relating to the prevention of oil pollution and issues concerning liability once any oil spill has occurred, be handled separately, in two distinct and non-overlapping Acts (President's Council 1/1991).

Furthermore, effective enforcement of the legislation has been constrained by practical difficulties such as tracing offenders (especially in cases of operational discharges) and determining whether the spill was intentional or accidental. Until recently, fines for illegal oil discharge have been relatively low. However, recent amendments to the legislation (S.30 as amended by S.5 of Act 9 of 1990) have resulted in the fines being considerably increased (Field and Glazewski, 1992). A further constraint to effective enforcement is that certain aspects of oil pollution control are administered by the SFRI and others by the Department of Transport.

It has been estimated that approximately three-quarters of the pollution in the sea emanates from land-based sources (Manuel and Glazewski, 1991). Effluent from industries and sewage treatment works as well as run-off from agricultural lands and urban areas may reach the coast directly, via storm water drains and pipelines, or indirectly, from run-off and seepage.

The main mechanisms for controlling pollution from land-based activities are the provisions in the Water Act 54 of 1956, and to a lesser extent the Conservation of Agricultural Resources Act 43 of 1983, and the Health Act 63 of 1977. The Water Act contains provisions for controlling the use of water for a wide range of industrial (which has been very broadly defined) purposes and requires that a permit be obtained to use water for such purposes. Of particular relevance to coastal pollution, are regulations in the Water Act (S. 21) which determine the quality of wastewater effluent that may be discharged into rivers. All effluent discharges must meet a set of criteria determined "general standards" or if the effluent is to be discharged into

certain sensitive rivers a set of more stringent "special standards" apply (Wiseman and Sowman, 1991).

These standards have been supplemented by non-statutory guidelines, developed by the Department of Water Affairs, which determine water quality criteria for the South African coastal zone (Lusher, 1984). The Minister may also, by regulation, determine the manner in which effluent is discharged and the exact place of discharge. To date no such regulations have been promulgated. However, exemptions from any or all of the requirements for effluent purification and disposal, may be obtained at Ministerial discretion (s.21(4)).

There are several shortcomings to the effluent standards approach, the most serious being that it does not take account of the cumulative effect of several effluents entering the river or watercourse or coastal system. A further criticism of this approach is that it does not provide an incentive to industry and other polluters to reduce pollution levels, since the requirement is simply to meet a certain standard (Lusher and Rabie, 1983). These shortcomings have resulted in the development of a new approach to effluent management, termed the Receiving Water Quality Objectives Approach. This new approach involves determining and imposing site specific effluent standards according to the pollution load from other sources and the capacity of the receiving waters to assimilate pollution without impinging on the water quality needs of other users (Wiseman and Glazewski, 1991).

The Water Act also provides for penalties for failure to comply with conditions set out in the Act. However, enforcement of these provisions is problematic due to the difficulty of obtaining evidence, lack of definition of the term "water pollution" in the legislation and inadequate fines for pollution offences. The combination of these factors have limited the effectiveness of the Act to achieve its purpose.

While opportunities exist in the Water Act to regulate agricultural activities in as far as they effect water quality (including the abstraction of water for agricultural use), it appears as though the Minister has not as yet exercised this authority (Wiseman

and Glazewski, 1991). Likewise, provisions in the Conservation of Agricultural Resources Act to protect water resources against pollution from agricultural practices exist, but have not been enacted.

Stormwater run-off from urban areas is recognised as a major cause of water pollution effecting coastal waters that is both diffuse in origin and difficult to control. While various national statutes provide opportunities for the management of stormwater runoff, no regulations to give effect to such provisions have been promulgated. Besides the National Building Regulations which contain certain requirements for the approval and installation of stormwater drainage systems, the control and management of stormwater run-off is largely handled at the local authority level in terms of by-laws (Wiseman and Glazewski, 1991). Such drainage and sewerage by-laws, for example, restrict what substances may be discharged into a stormwater drain or watercourse and may impose fines for illegal discharges. Effectiveness of these by-laws is hampered by difficulties of monitoring illegal discharges, staff shortages, lack of qualified personnel, inadequate fines as well as non-payment of fines.

In addition to legislative mechanisms, "Guidelines for the Provision of Engineering Services in Residential Townships" (Department of Community Development, 1983) have been prepared. Although not comprehensive or enforceable, these guidelines do provide advice on stormwater management issues, such as methods for the retention of stormwater to prevent flooding, and the integration of stormwater drainage systems with the design and layout of roads.

Increased contamination of coastal waters from urban run-off - due to rapid urbanisation and deregulation of industry - is of particular concern to CZM efforts. With the changing socio-political circumstances in South Africa, priority is being given to the provision of land and infrastructural services for lower income communities in urban areas. There is thus an urgent need to develop appropriate procedures and mechanisms for the effective management of stormwater runoff and sewage effluent, especially in urban areas located in the coastal zone.

(5) *Coastal Environmental Education and Awareness*: Since the establishment of the Council for the Environment in 1982, considerable progress has been made in the general field of environmental education in South Africa. In 1989 a White Paper on Environmental Education, outlining policy and principles on the subject, was prepared and accepted by Parliament. In addition, the Council for the Environment's document "An approach to a National Environmental Policy and Strategy for South Africa" (1989b), identifies the principles and objectives of environmental education as well as a strategy to obtain these stated objectives. Obviously these general principles and objectives are of direct relevance to any coastal environmental education programmes. Other initiatives, such as the establishment of the Environmental Education Association of Southern Africa (EEASA) and the Soweto-based National Environmental Awareness Campaign (NEAC) have played a major role in co-ordinating and promoting environmental education efforts.

In addition to the above initiatives, there are numerous publications and books which deal with coastal systems, aspects of coastal resource management and field guidebooks, all of which have considerable educational value. However, much of this information only reaches a small percentage of the total population and has not been developed specifically to enhance awareness or educate the public on coastal zone management issues. What is required is a co-ordinated education/awareness programme for CZM in South Africa. In fact, public education programmes and participation are considered to be the foundation of success for any coastal resource management programme in developing countries (Hale, 1991).

A recent initiative by the Department of Environment Affairs, called "The Coastal Management Advisory Programme" (CMAP), is a first attempt at such an education/awareness programme. It aims to increase awareness of the public, developers and controlling authorities about the value of the coast, its special characteristics, its sensitivity to certain activities and the need to use and develop coastal resources on a sustainable basis. CMAP adopts a three pronged approach. Seminars are held at regional centres around the coast to provide authorities with practical information on the tools which exist to assist with CZM tasks. Secondly, a technical manual for

CZM, providing detailed specifications for practical management tasks, such as fencing and beach access, is being compiled. Thirdly, popular brochures on coastal conservation issues are being prepared for the public.

While it is still too soon to evaluate the success and effectiveness of the CMAP, the limited resources of the Department of Environment Affairs are bound to limit the effectiveness of such a programme.

(6) *Public Participation Programme*: It is now recognised that if initiatives in CZM are to succeed and be effective, not only must they be technically sound but they must be accepted by the public as necessary, reasonable and fair (Hale, 1991).

Involvement of the public in coastal zone management efforts in South Africa has been minimal to date. The reasons for this lack of participation can be summarised as follows: firstly there are limited opportunities in our National, Provincial and local legislation for participation (Rabie and Erasmus, 1983; Van Zyl, 1987). Secondly planners and decision-makers have traditionally adopted an expert approach to planning and development. Thirdly, and most notably, the system of Apartheid has effectively excluded the majority of citizens from planning and participating in decision-making around issues which affect their lives.

The involvement of the public in coastal zone management initiatives - from policy formulation to on the ground beach clean-up projects - is essential if such initiatives are to be accepted and effective. Obviously, public participation will be more effective if the public are adequately informed; the task of any education/awareness programme. This re-enforces the importance of co-ordination and co-operation between the various individuals, organisations and government departments involved in coastal zone management projects and programmes.

Opportunities for increased public involvement in environmental decision-making generally, have been provided in the new Environment Conservation Act 73 of 1989. For example Section 32(1) requires that a draft notice be published in the Gazette,

if the Minister or any local authority intends to issue a regulation or a directive in terms of the Act, or to declare an area a protected natural environment, a special nature area or a limited development area, or to identify certain activities or to determine an environmental policy (Rabie, 1990). While the purpose of publishing the draft notice is to elicit public comment on the proposed administrative action (S.32(2)) and is thus welcomed, it fails to oblige the administrative body concerned to consider the comments that have been received and modify proposals in the light of such comments.

Clearly, much work needs to be done to improve the involvement of the public in coastal zone management efforts.

(7) *Research Effort*: One of the cornerstones of any coastal zone management system is its information base which usually emanates from research programmes and projects. Whilst a considerable body of knowledge relevant to the coastal environment exists, research efforts have focussed primarily on gaining an understanding of the basic structures, processes and relationships in the natural coastal and marine environment (SANCOR, 1986).

Little attention has been given to socio-economic, political and cultural considerations and how these effect coastal management approaches, plans and systems. Over the past year, two independent investigations relevant to past research efforts in the coastal zone have been undertaken. The first study compares past research efforts with the perceived research needs of managers (Sowman and Wiseman, 1991) and the other provides a management perspective of marine and coastal research carried out in South Africa over the period 1975 - 1991 (Shackleton, 1992). Both these reports suggest that the focus of past efforts has been on basic science, ecological studies and conservation-orientated research. The findings also indicate that the foci of past research activities is, to a large extent, at variance with the problems and issues perceived as important by coastal managers (Sowman and Wiseman, 1991). There is the perception amongst coastal managers that sufficient information exists on natural systems (Shackleton, 1992) and that

efforts should now be directed towards "taking stock" of existing information and making it accessible to managers.

Especially with rapidly changing socio-economic and political circumstances in South Africa, there is a recognition by coastal managers that greater emphasis needs to be given to research which attempts to understand and manage human-environment-resource interactions.

At this point in South Africa's history it may be wise and appropriate to allocate more funds to research which is problem-orientated and socially relevant. Furthermore, it is recommended that a more participatory approach to research be adopted (Sowman and Wiseman, 1991). For research results to be understood, accepted and incorporated into management decisions, it is imperative that interested and affected parties be involved in the research process. Only then will results from research be accepted and management action emanating from research be successfully implemented.

Finally, there needs to be improved co-ordination of research efforts and better communication amongst those involved in coastal research. Also there needs to be better networking with other organisations, particularly service organisations and community-based organisations, involved in research and advisory work in disadvantaged communities in the coastal zone.

## CURRENT INITIATIVES

### **Coastal Action Strategy (COAST)**

The inability of the current planning system in South Africa to address pressures in the coastal zone arising from changing socio-political circumstances and increased population growth, prompted the initiation of the Coastal Action Strategy (COAST) programme.

The aim of COAST is to develop a dynamic planning and management system for the coastal zone using computer-based GIS technology to focus on the critical components of environmental sustainability and the projected requirements of the population growing at a critical rate (Kapp Prestedge Retief, 1990a).

Specific objectives of COAST include:

1. The development of a dynamic decision support system that will:
  - review existing planning and related research efforts, and foster communication between planners and researchers;
  - integrate socio-economic needs and environmental resources in land-use planning processes;
  - investigate alternative scenarios over various time horizons;
  - formulate appropriate action strategies for coastal planning through expert input.
2. The production of strategic planning guidelines, based on case study investigations.
3. The formulation of interim recommendations on issues requiring immediate attention, including gaps in research knowledge and manpower training needs (Kapp Prestedge Retief, 1990b).

While there is an urgent need for such a dynamic planning and management system, the problem of integrating COAST into the already complex and fragmented planning system operating in South Africa may prove difficult. Other products which will emanate from this project, such as the GIS for Coastal Resource Planning, should however contribute towards improved planning and development in the coastal zone.

### **Limited Development Areas (LDA's)**

In terms of the new Environmental Conservation Act, the Minister may by notice in the Gazette declare any area defined by him, as a limited development area (LDA) (S.23(1)). Any area, including the coastal zone, may be thus defined and any activity or development would be subject to control in a LDA. Provision is also made for the decision-making authority to request that an EIA be undertaken for any proposed activity in a LDA.

At present, the two coastal provinces have been given the task of identifying LDA's for the coastlines under their jurisdiction. The Provinces have adopted a different approach to this task. In the Cape, the cadastral boundaries which represent the closest approximation to the ecological coastal zone boundary, previously identified by the CPA, have been utilized as the landward boundary of the LDA's. In the Cape, it has been proposed that all coastal land within these boundaries be declared a LDA. In Natal, much of the coastline has already been transformed by development. Thus it was felt that only those coastal areas considered to have high conservation value should be earmarked for incorporation into LDA's. Thus the total area of coastal land given LDA designation in Natal would be relatively small by comparison to the Cape.

Once this task is complete the Minister will be able to declare LDA's within the coastal zone. Guidelines for the management of LDA's are also currently in preparation (Schneier, DEA, pers comm.). The declaration of LDA's will certainly curtail the activities of insensitive developers in certain designated areas and will require that environmental considerations are taken into account in the planning and decision-making process.

### **Integrated Environmental Management (IEM)**

One of the key weaknesses in South Africa's environmental management system generally has been the absence of a statutory, structured procedure which requires

that environmental considerations are efficiently and adequately taken into account in the planning, assessment and decision-making process. The lack of a socially perceived need for EIA procedures in developing countries and the negative connotations associated with the EIA process - for example time delays and additional project costs (Hill and Fuggle, 1988; Fuggle, 1989) - necessitated the development of environmental evaluation procedures which would be acceptable to South Africans. Consequently, procedures aimed at identifying the most appropriate proposal or alternatives - rather than only highlighting the negative impacts associated with a proposal - as well as integrating environmental and community concerns in plan formulation have been developed.

This procedure, referred to as Integrated Environmental Management (IEM) (Council for the Environment, 1989c), is intended to guide rather than impede, the development process, and requires that environmental concerns associated with the proposal and its alternatives are adequately and timeously considered in the planning and decision-making process. The key principles which underpin IEM are: that a broad meaning is given to the term environment; an open, participatory approach is adopted in the planning process; decision-making is informed, and that there is accountability for decisions taken. The procedure, which will apply to all private and public sector proposals, is a generic procedure for all projects, plans, programmes and policies which will result in significant impacts on the environment. A description of the procedure will not be presented here since several papers and reports documenting the principles and procedures of IEM have been published (Hill and Fuggle, 1988; Fuggle, 1989; Council for the Environment, 1989c; Fuggle, 1990; Fuggle et al., 1992).

Whilst IEM provides a general approach to environmental planning and decision-making, it is of particular relevance to the project assessment and review process in CZM and if adopted, should considerably improve planning and development practice in the coastal zone. In the most recent document prepared on IEM (Fuggle et al., 1992) it is recommended that departments and organisations responsible for undertaking specific activities (dams, roads, resorts) be encouraged to develop

specific procedures and guidelines within the IEM framework, for the planning, assessment and development of such activities.

## **ACTION REQUIRED TO ACHIEVE AN INTEGRATED CZM PROGRAMME IN SOUTH AFRICA.**

The foregoing review and analysis of the status of CZM in South Africa reveals that considerable progress has been made with the development and implementation of a variety of strategies to achieve sustainable use and development of the coastal zone. It has also highlighted some of the obstacles to formally declaring and implementing a comprehensive CZM system in South Africa.

The key shortcoming in this process has been the absence of a policy framework, within which various CZM efforts can be guided. Such a policy framework must be accompanied by supporting legislation and appropriate administrative structures for its implementation. The Environment Conservation Act 73 of 1989 provides a possible vehicle for declaring such a policy (S.2(3)). However, the requirement to obtain concurrence of other Ministers who may be affected by the declaration of a policy for CZM (S2(2)), may severely delay or obstruct the process of policy formulation. Support from other departments and institutions will only be forthcoming when there is an understanding that the aims of a CZM programme are complimentary to economic development programmes. Co-ordination of these efforts is the only way to ensure the long term economic sustainability of coastal resources and ecosystems. This reinforces the need to develop and expand coastal environmental education and awareness programmes such as the CMAP.

Another route to explore in order to facilitate the declaration of a CZM policy would be to promulgate a separate act of parliament which deals specifically with all matters relevant to CZM. Establishment of a separate Coastal Zone Management Act, which could incorporate many provisions of the Sea Shore Act 21 of 1935 and other pertinent legislation, has been widely advocated by experts in the field of CZM

(Rabie, 1987; Rabie, 1990; Department of Environment Affairs, 1991; Glavovic, 1991; President's Council, 1991). Promulgation of such an Act would contribute towards streamlining the plethora of legislation relevant to CZM as well as focusing administrative responsibilities amongst the multitude of authorities involved in CZM efforts.

A further obstacle to effective CZM in South Africa has been the lack of co-ordination amongst the various departments, institutions and individuals involved in CZM. Given the sectoral approach adopted by most government departments, it is imperative that a "lead agency" or Co-ordinating Unit, at Central Government level, be appointed to co-ordinate activities and efforts relevant to CZM. The overall tasks of this Co-ordinating Unit would be to facilitate the development of policy and strategies required to achieve the aims and objectives of CZM; to guide implementation of the overall programme; to ensure compliance of other departments and the private sector with established CZM principles and procedures, and to monitor and evaluate the effectiveness of the overall programme.

Where existing institutional arrangements are effective in implementing the various strategies to achieve CZM goals, these structures should remain in place. The most appropriate location of such a unit would be within a department already charged with certain coastal management responsibilities, such as the Department of Environment Affairs. Until an effective system of project appraisal is instituted, this unit should take responsibility for reviewing all major development projects as well as plans, policies and programmes likely to significantly impact on coastal resources.

Since the system of land-use planning is probably the most effective mechanism through which environmental concerns can be addressed, it is imperative that the principles and procedures guiding planning and environmental conservation efforts be better integrated, and that improved understanding be fostered between these two disciplines. The concept of environmental planning needs to be promoted and provisions contained in the new Environment Conservation Act as well as the

principles and procedures of IEM, need to be integrated into the physical planning and development process in South Africa.

Finally, the successful implementation of any CZM system will ultimately depend on the support of the public and on the commitment of politicians to the CZM programme development process. To achieve this, a comprehensive public involvement programme must be developed which involves the public in all aspects of policy and programme development, implementation and evaluation.

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## PAPER 3

# A REVIEW OF THE EVOLUTION OF ENVIRONMENTAL EVALUATION PROCEDURES IN SOUTH AFRICA\*

## INTRODUCTION

The enactment of the National Environmental Policy Act of 1970 (NEPA) in the United States is recognised worldwide as the formal inception of environmental impact assessment (EIA) - a procedure for identifying and investigating the environmental consequences of development, as an aid to decision-making. This event triggered the development and implementation of formal and informal environmental evaluation<sup>1</sup> procedures in both developed and developing countries. Whilst the adoption of environmental evaluation procedures, either by legislative or administrative control, has been in evidence in many developing countries since the late 1970's (Horberry 1984; Wathern 1988; Brown 1990; Sorensen and West 1990), South Africa has been slow to develop procedures appropriate to its circumstances.

It was only as recently as 1989, that South Africa enacted legislation (Act 73) which provides for the determination of environmental policy to guide decision-making. Provisions exist in the new Environmental Conservation Act 73 of 1989 to regulate activities that may have a detrimental impact on the environment and to require that environmental impact reports be prepared. In that same year, a document was published (Council for the Environment 1989) outlining a recommended evaluation procedure for integrating environmental considerations into decision-making at all stages of the planning and development process. At the time of writing, there is still no legal requirement that these procedures be adopted.

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\* Paper accepted for publication in *Environmental Impact Assessment Review*.

1. The broad term environmental evaluation is used since it encompasses the more specific activities of environmental (impact) assessment, environmental analysis and initial environmental assessment.

The key constraints to the development and implementation of environmental evaluation procedures in South Africa have been; the absence of a general environmental policy, a lack of political will and awareness of the need to consider environmental issues, an authoritarian system of government, a lack of accountability by decision-makers, inadequate public participation, inefficient administrative structures, legislative inadequacies, as well as a lack of environmental expertise and financial resources.

The constraints described above are not unique to South Africa and have inhibited the development of environmental procedures and practices in many developing countries (Horberry 1984; Kennedy 1988).

Another important factor constraining the development of an environmental policy and enabling procedures in South Africa, has been the lack of popular support afforded environmental issues. This is understandable in the light of past political policies and practices which effectively alienated black people from their traditional role as guardians of the land and engendered a negative attitude towards environmental issues (Khan 1990; Cock and Koch 1991; Ramphela 1991; African National Congress (ANC) 1992). Consequently, until recently environmental issues have not been high on the political agenda. However, a perspective is emerging which views environmental issues as deeply political since they are concerned with access to and utilization of resources (Cock 1991). The concept of sustainable development is also receiving widespread support from academics, business leaders, grassroot groups, trade unions, non-governmental organizations and political groups.

A further factor that constrained the implementation of environmental evaluation procedures in South Africa was the recognition by proponents of EIA that the direct transfer of United States and European models to South Africa would not be appropriate. Consequently, considerable research, deliberation as well as public and authority participation was undertaken to formulate procedures appropriate for South Africa.

This paper traces the events that led to the development and endorsement of an environmental evaluation procedure for South Africa. It examines the key socio-economic and political factors which shaped the philosophy underlying Integrated Environmental Management (IEM); the procedure eventually recommended by the Council for the Environment in 1989 for adoption in South Africa. A description and appraisal of the IEM procedure is then presented.

## BACKGROUND TO THE DEVELOPMENT OF ENVIRONMENTAL EVALUATION PROCEDURES IN SOUTH AFRICA

### Historical Perspective

Evidence of concern for the environment can be traced to our earliest history, both in terms of the practices and lifestyles of indigenous people (West 1979; Owen-Smith 1987; Khan 1990) and the initial conservation efforts of the early foreign settlers and public officials (Hey 1977; Fuggle and Rabie 1992). The focus of initial conservation efforts was on the protection of wilderness areas and wildlife resources (Cock and Koch 1991; Fuggle and Rabie 1992). It is only in this decade that a more integrated, participatory approach to environmental concerns is in evidence and "green politics" are slowly making their way towards the central political arena (Ramphela 1991).

With its impressive network of national parks and game reserves, and a professional conservation corps unequalled in Africa, South Africa has cultivated its image as the continent's conservation leader (Durning 1990). Yet evidence of severe environmental degradation and social deprivation, especially in the "homelands"<sup>2</sup>

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2. In 1913 about 13% of the land in South Africa was set aside as "native reserves" for approximately 70% of the population. Africans could legally acquire land only in these areas. The government decided in 1959 that "Bantu peoples" formed separate nations and therefore ought to have their own "independent states" ("homelands") based on the "reserves". Examples: Transkei, Ciskei and Venda.

and the "black" areas of urban centers, suggests otherwise. Increasingly, environmental historians are linking environmental degradation and the negative, alienated stance of the majority of South Africans towards environmental issues, to the policies and practices of the colonial and apartheid eras (Khan 1990; Ramphele 1991; African National Congress 1992). The processes of colonization, dispossession and European expansion, effectively alienated the majority of South Africans from the land and cultivated negative, even "hostile" attitudes toward environmental issues (Khan 1990). Efforts to foster greater environmental awareness and promote regulation of activities and decisions which were harmful to the environment were thus in the hands of the government and white elite.

### **Recent Events**

International events, such as the United Nations Conference on the Human Environment held in Stockholm in 1972, and in particular the enactment of NEPA in the United States in 1970, and the introduction of EIA as an instrument of environmental policy, encouraged concerned government officials, professionals and academics to explore the merits of introducing a similar mechanism into the South African planning and administrative system. During the 1970's the debate on the necessity for and appropriateness of EIA as a tool for promoting environmental conservation was raised in several fora.

A review of the early minutes of the Habitat Council, a non-governmental organization established in 1974 to coordinate the activities of various environmental organisations in South Africa, reveals that the subject of EIA frequently featured on their agenda. In fact, at the 1977 Annual General Meeting, a resolution was taken, that "...the Minister of Planning and the Environment be approached regarding the need for legislation which would demand the provision of EIS from developers ... when embarking on major development or re-development planning" (Council for the Habitat 1977). Professional planners were identified as the group who should provide guidance on the integration of environmental concerns in project planning and design. An inter-disciplinary committee representing the various environmental

planning professions (EPPIC) was also established in 1974. One of its primary tasks was to prepare a set of guidelines to assist the planning professionals in taking environmental aspects into account in an effective manner (EPPIC 1980). These guidelines, published in 1980, certainly played a role in enhancing the awareness amongst professionals of the need to consider environmental issues in project planning. However, there were major shortcomings in the guidelines, especially with respect to screening criteria, review procedures, public involvement and consideration of alternatives, and they were consequently never adopted.

A significant event in the development of EIA in South Africa was a gathering of organisations, government departments, academics, professionals and members of the general public, concerned with the question of environmental evaluation at a symposium on "Shaping our Environment" in 1979. The main objectives of the symposium were to emphasize the value of EIA as an aid to the management of environmental change and to examine the various methods of EIA, with a view to incorporating the principles of EIA into guidelines for use by professional planners (Blight 1980).

The symposium was seen as part of an ongoing process of developing the philosophy and procedures of environmental evaluation appropriate for South Africa. Organisations such as the Habitat Council, and in particular, EPPIC and the Department of Environmental Planning and Energy Affairs (the State Department responsible for environmental affairs at the time), were charged with the task of taking the EIA process further and developing the ideas generated at the conference (Blight 1980).

Increased awareness at central government level of the need to consider the environmental impacts of major development projects is evident in a report "Bepaling en Evaluering van Invloede van Ontwikkelingsprojekte op die Omgewing" [Identification and Evaluation of the Effects of Development Projects on the Environment] prepared by the then Council for the Environment (1976). This Council, formerly known as the South African Committee on Environmental

Conservation, was established in 1972 to advise a cabinet committee concerned with environmental conservation (Fuggle and Rabie 1992). This report addressed methods of identifying impacts, and proposed procedures for environmental evaluation in South Africa. However, it does not appear as though these proposals were ever developed or implemented.

The thinking amongst professionals and academics on the subject of EIA procedures in South Africa is reflected in many articles published in various journals and reports in the late 70's and early 80's (Patricios and Fuggle 1975; Rabie 1976, 1986; Boden 1980; Blight 1980; Cowen 1980; EPPIC 1980; Fuggle 1979, 1980; Hall *et al* 1980; Fuggle and Rabie 1983; Stauth 1983; Beaumont 1984; Glavovic 1984; Retief and Bosman 1984; Zakrzewski 1984). The promotion of the concept of EIA and the development of the philosophy underpinning the principles and procedures of environmental evaluation eventually adopted in South Africa, was largely due to the work of a handful of dedicated academics and professionals, many of whom served on the various committees and councils concerned with environmental management in South Africa.

Further evidence of the government's recognition of the value of EIA as an aid to decision-making was given in the 1980 "White Paper on a National Policy Regarding Environmental Conservation". The stated purpose of the White Paper was to "formulate a national policy on environmental conservation...which will, in broad outline, afford the necessary protection to the natural as well as the urban environment... Furthermore ... the environment (both natural and man-made) should become a normal consideration in the planning, development and operational phases of projects". However, it should be noted that a white paper is a declaration of intention and is not legally binding. Its value is thus limited since it does not serve as an obligatory guideline for administrative actions affecting the environment (Rabie 1990). Following on the White Paper, the State President appointed a Commission of Inquiry into environmental legislation in 1981. The Commission's report adopted and expanded upon the policy recommendations contained in the White Paper and a draft bill on environmental conservation was proposed.

The White Paper and draft bill formed the basis for the Environmental Conservation Act 100, promulgated in 1982. Despite its all-embracing title, this legislation was mainly concerned with the co-ordination of environmental matters and contained limited provisions to regulate activities and decisions harmful to the environment. It also provided for the establishment of a statutory Council for the Environment, to advise the Minister of Environment Affairs. Despite its prominence in the White Paper, EIA was not mentioned explicitly in the legislation as a mechanism for achieving policy objectives. Pressure was also exerted on the South African government by the international community to introduce EIA as a legal mechanism for regulating activities likely to have a significant effect on the environment. At the third World Wilderness Congress, held in Findhorn, Scotland in 1983, the following resolutions were passed: "That the South African Council for the Environment be requested to recommend to the Minister of Environment Affairs that legislation be introduced as a matter of urgency providing for:... the furnishment... of environmental impact statements in respect of any regulations or development projects directed at or liable to have a substantial influence on the environment" (Glavovic 1984).

An indication of the government's response to public concern regarding environmental impacts associated with development, was the State President's request to the President's Council, an advisory council, in June 1982, to advise on "the principles according to which priorities between development and conservation can be stated". This resulted in the publication of 2 reports (PC 2/1984 and PC 5/1984) which advocated the compulsory introduction of EIA for development projects outside Guide Plan Areas<sup>3</sup>. This committee also recommended that the Council for the Environment investigate and recommend policy to guide the implementation of EIA in South Africa. However, it would appear that these reports had little impact or influence since very few recommendations have ever been acted upon.

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3. A guideplan lays down guidelines for the future spatial development of a particular defined area, in that it determines that land may be utilised for a specific purpose/s only.

The establishment of the Council of the Environment in 1983 in terms of the 1982 Act, and the formation of various sub-committees, in particular the Committee for EIA, played a significant role in the development of environmental evaluation procedures in South Africa. The EIA Committee was instrumental in initiating research, workshops and consultation on the subject of EIA for South Africa. From the outset there was a clear commitment to seek procedures and mechanisms of implementation which would suit the South African situation and not simply import procedures implemented elsewhere.

The initial research task of this committee was to gather, synthesise and document all available information on models of EIA procedures adopted elsewhere, their strengths and weaknesses as well as various critiques on the state of the art. This documented information (Schweizer 1985) provided the foundation for a National Workshop, held at Midmar, Natal, in 1985, to recommend a South African policy on EIA. Here government officials, professionals and academics explored the significance and necessity of EIA, which elements a South African model should embrace, and mechanisms of implementation. The conclusions reached at the workshop indicated almost unanimous support for the introduction of EIA as part of a comprehensive, holistic planning procedure (Council for the Environment 1986), but there was considerable divergence of opinion as to how EIA should be implemented (Rabie 1986). Based on the conclusions and recommendations of the workshop, the Council for the Environment was given the task of developing the ideas generated at the workshop through further research, consultation and review.

Consequently, a working group, including members of the EIA Committee of the Council, was appointed to develop the philosophy on environmental assessment for South Africa and determine a systematic procedure for incorporating environmental considerations into planning, decision-making, development and management actions and processes. What followed was a two-year period of research, consultation and review which culminated in the publication of a document entitled Integrated Environmental Management (IEM) in South Africa (Council for the Environment 1989). The term IEM was chosen to indicate an approach which

integrates environmental considerations into all stages of the planning and development process and requires post impact assessment monitoring and management. It was felt that the term EIA was inappropriate since the EIA process was perceived to be too limited in scope, reactive, anti-development, too separate from the planning process and often the cause of costly delays (Council for the Environment 1988). The Council recommended that the government adopt the principles and procedures of IEM which would necessitate a more holistic and responsible attitude towards the environment by developers and professionals. In order to disseminate the ideas embraced in the IEM approach, popular pamphlets and posters were prepared and distributed and several introductory workshops were held throughout the country.

Parallel to the activities of the Council for the Environment and their researchers, proposals for possible models of EIA for South Africa were forthcoming from academics (Fuggle 1983; Stauth 1983 and 1989; Retief and Bosman 1984; Van der Westhuysen 1984; Sowman 1987), professionals (EPPIC 1980; Hall *et al* 1980) and government departments (Departement van Waterwese 1990; Porter and Van der Vegte 1987; Van der Westhuysen and Little 1985). In particular, various procedures for evaluating the environmental impacts of development applications in the coastal zone were developed (Retief and Bosman 1984; Committee for Coastal and Marine Systems 1986; Sowman 1987). The latter proposals were in response to the increased concern regarding *ad hoc* planning and inadequate regulation of development activities in the coastal zone. Again, none of these proposals was ever fully developed, debated or adopted. This is probably due to the fact that the proposals reflected the thinking of a particular individual or institute and had not been developed in consultation with theorists and practitioners as well as administrative authorities who would be responsible for their implementation.

Increasingly, it became evident that any environmental evaluation system developed for South Africa had to be flexible, generally applicable, widely accepted and practical to implement. Once such a generic procedure was in place, more detailed

procedures and guidelines for specific types of projects, policies or plans could be developed.

### **The Practice of Environmental Evaluation in South Africa**

During the 1980's the voluntary undertaking of EIA's as an input to decision-making increased. This was largely in response to enhanced environmental awareness amongst the public and their demands that environmental factors be explicitly considered in the decision-making process. Furthermore, the principle of environmental evaluations as compulsory components of all development projects received wide-spread support from business leaders and professional ecologists (Preston, Fuggle and Siegfried 1989). Increasingly, decision-making authorities requested that proponents submit environmental impact assessment reports, especially in the case of major controversial development applications.

Provisions in certain legislation, in particular the Natal Town Planning Ordinance 27 of 1949, the Physical Planning Act 88 of 1968 and the Cape Land Use Planning Ordinance 15 of 1985, enabled administrative authorities, at their discretion, to require additional information pertinent to the proposal to be submitted. Clearly, this could be interpreted to include the preparation of an EIA report. However, in the absence of clear procedures and guidelines for preparing such reports and in the absence of peer and public review, the quality and adequacy of these reports differed markedly (Theunissen Cape Provincial Administration 1992, pers. comm.).

At the time of the publication of the IEM documents in 1989, professionals, business leaders and administrative authorities were receptive to adopting a procedure which would ensure the structured inclusion of environmental considerations in decision-making. In general, IEM has been adopted either formally or informally by both businesses and authorities (Posnik *et al* 1991). Many government departments, most notably the Departments of Water Affairs (De Kock 1991), Mineral and Energy Affairs, and Transport, are supportive of IEM and are currently modifying their policies and procedures to comply with the IEM approach. Furthermore, the

Provincial Administrations, local authorities of the major urban centers, as well as agencies responsible for various aspects of environmental conservation such as the Natal Parks Board (Porter and Brownlie 1990) have begun implementing the principles and procedures of IEM.

The publication of the IEM procedural document in 1989 coincided with the promulgation of the new Environmental Conservation Act 73 of 1989 which replaced Act 100 of 1982. Provisions contained in this legislation provide opportunities to give IEM the force of law. Of particular importance is the enabling clause which empowers the Minister of Environment Affairs to determine (or to amend or withdraw) a general policy with respect to the protection, sustained utilization, maintenance and improvement of the environment. The subjects in respect of which policy may be made are broadly phrased, allowing much scope and flexibility for the formulation of a comprehensive environmental policy (Rabie 1990). In terms of the new Act, decision-making authorities would be required to comply with the stated policy.

Practical experience gained from implementing IEM suggested that certain changes were necessary to make the recommended procedures more effective and acceptable for policy formulation. In addition, extensive guidelines, in particular guidelines for scoping, report requirements and review were required for the implementation of IEM. Consequently, the Department of Environment Affairs appointed consultants to refine the procedures in the light of practical experiences and develop a series of guidelines to assist planners, decision-makers and the public fulfill the tasks of IEM.

The revised IEM procedure and a series of guideline documents and checklists, were finally published in 1992 (Department of Environment Affairs 1992). Before describing the principles and main components of IEM, it is pertinent to consider the socio-economic and political factors that influenced the philosophy underpinning IEM and the form of environmental evaluation eventually recommended for South Africa.

## FACTORS INFLUENCING THE FORM OF ENVIRONMENTAL EVALUATION RECOMMENDED FOR SOUTH AFRICA

### **The Need to Promote Economic Growth and Development**

As in most developing countries, the promotion of economic growth and development are essential national goals in South Africa (Fuggle 1990; Huntley *et al* 1989). This is necessary in order to provide for the needs of an expanding population and to redress the inequalities of the Apartheid era. The following example serves to illustrate the enormous development effort required to redress these imbalances: there are at the present time, approximately 7 million people living in informal settlements<sup>4</sup> in South Africa (Strelitz 1991) and it is estimated that in order to meet the housing shortage by the year 2000 between 2-3 million dwelling units are needed.

Hence, an environmental evaluation process would have to take cognizance of these requirements and encourage development through the identification of environmentally acceptable alternatives to meet the stated need rather than on focusing on the negative impacts associated with the proposal (Fuggle 1990). The emphasis has to be on enhancing the positive aspects of the proposal, identifying appropriate mitigatory<sup>4</sup> measures, and ensuring that the social benefits of the preferred alternative outweighs the social costs. This approach applies equally to policies, programmes, plans and projects.

In order to minimize delays in drafting policies and processing development applications, environmental considerations and public concerns must be integrated into the existing system of proposal formulation, assessment and decision-making. Furthermore, only key issues should be investigated, to avoid costly delays required

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4. Informal Settlements are formed when disenfranchised communities settle on public or private land for the purpose of constructing temporary shelters using unconventional building materials such as zinc, plastic, and hardboard.

to investigate and prepare lengthy reports, often containing information irrelevant to the decision-making process.

### **Practical Considerations**

The failure of South African politicians to recognise the importance of environmental issues in the planning and decision-making process, has retarded the development of environmental expertise in the country. It is estimated that at present there are less than 200 persons with higher degrees related to environmental expertise and less than 500 persons that have been exposed to short intensive training programmes to equip them to undertake environmental evaluations.

In reviewing the various procedures of environmental assessment employed elsewhere, the lack of suitably trained personnel in South Africa had to be taken into account. The advantages of utilizing an expert system for environmental evaluation prompted the research team to seriously investigate this option. However, a telephonic survey of a representative sample of local authorities in South Africa revealed that the majority of smaller local authorities did not possess the computer hardware nor the skilled personnel to implement such a system. There was definitely a reluctance, particularly from the smaller local authorities, to utilize a computer-based system. Instead, a firm preference was expressed for an approach which employed checklists.

With changing political circumstances in South Africa, and its increased international involvement, it was desirable that the procedure developed for South Africa be compatible with, but not dependent upon, systems utilised elsewhere in the world. These practical considerations also influenced the direction in which environmental evaluation developed in South Africa.

### **Failure of the Expert/Elitist Approach**

The system of Apartheid has encouraged the adoption of an expert/elitist approach towards planning and decision-making (Sowman, Gawith and Robins 1992). Proponents of this model - professional planners and engineers, decision-makers and politicians - believe that those who are best qualified and most knowledgeable should be responsible for making societal decisions (Hudspeth 1982). A key criticism of this approach is that technical and financial, rather than environmental and social considerations, dominate the decision-making process.

Since many projects involve complex technical issues, often beyond the understanding of the public, many professionals and politicians believe that the public are not qualified to make judgments or provide meaningful contribution to the planning and decision-making process.

However, an increased awareness amongst the public of the environmental implications of development activities, as well as a growing insistence from communities of the right to be consulted, suggest that this approach is no longer acceptable and workable. Clearly, a more holistic, multi-disciplinary and participatory approach is urgently required. Any proposed environmental evaluation procedure in South Africa would have to address these concerns. In particular, the public would have to be involved throughout the lifecycle of projects, including the monitoring of developments once implemented.

### **A Move towards Participatory Democracy**

Policy formulation and administrative decision-making in South Africa is highly centralized, secretive and dominated by the political executive and higher reaches of the bureaucracy (Boulle 1990). The Apartheid system, designed to exclude the majority of South Africans from political participation, necessitated the development of administrative, legal and social structures which prevented people from participating in decisions affecting their lives. However, recent political developments

in South Africa, in particular the activities of the mass democratic movement and more recently, President De Klerk's historic speech in February 1990, represented a decision from the white minority government to move away from authoritarian rule to a more democratic, non-racial and participatory system of government (Ramphela 1991).

Whilst a national political settlement is required before participatory mechanisms can be meaningfully constructed, Boulle (1990) has identified other changes which would be necessary prerequisites for meaningful participation in administrative decision-making. These include improved access to state-controlled information (and the courts) and to the decision-making process, the encouragement of critical debate and the furnishing of reasons for decisions taken. The need for uniform procedures which would be familiar to the public and which would compel public authorities to satisfy at least minimum standards of participation was also identified. The environmental evaluation procedure recommended for South Africa would thus have to embrace these principles if it is to achieve wide-spread support.

The factors described above significantly influenced the principles guiding the evaluation procedure developed as well as the procedural requirements of IEM.

## THE INTEGRATED ENVIRONMENTAL MANAGEMENT PROCEDURE<sup>5</sup>

### Introduction

Integrated Environmental Management is a systematic procedure for ensuring that the environmental impacts and implications of proposals (including policies, programmes, plans and development projects) are investigated and adequately

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5. The description of the IEM procedure has been largely drawn from the recently published IEM document (Department of Environment Affairs 1992). The author was a member of the research team that developed the procedure and guidelines and prepared the document.

considered in the planning and decision-making process. The purpose of IEM is to reconcile conflicting interests and concerns and improve proposals by minimizing negative impacts and enhancing positive aspects. This can be achieved by adopting the principles of IEM and adhering to the procedural framework provided.

The key principles underpinning the IEM procedure are:

- a broad understanding of the term, environment (ie one that includes physical, biological, social, economic, cultural, historical and political components);
- informed decision-making;
- accountability for decision taken;
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- mitigation of negative impacts, and enhancement of positive aspects, of proposals;
- ensuring that the "social costs" of development proposals (those borne by society, rather than the developers) be outweighed by the "social benefits" (benefits to society as a result of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of proposals (ie, from "cradle to grave"), and
- the opportunity for public and specialist input in the decision-making process.

IEM applies to all public and private sector proposals that are subject to the approval of any government authority.

A flow diagram, showing the various stages and decision points in the IEM procedure is given in Figure 1. Various guidelines and checklists have been developed to fulfill the tasks of IEM and are referred to throughout the description which follows.

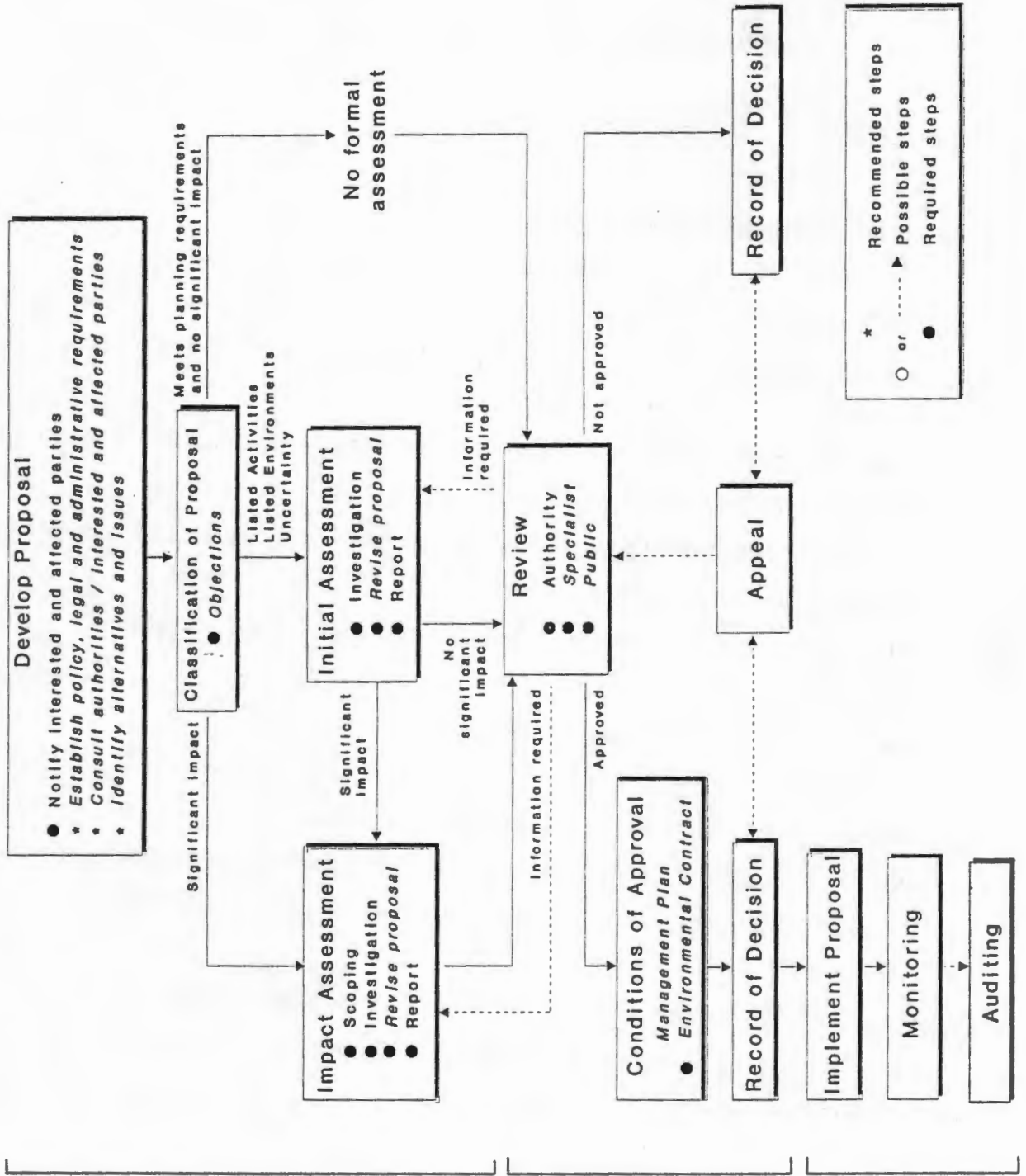


Figure 1 Integrated Environmental Management Procedure

The IEM procedure recognizes three stages in the development of any proposal: Stage 1 is concerned with the development and assessment of proposals, Stage 2 with decision-making, and Stage 3 with the implementation of proposals. However, rigid adherence to the various stages is not required as long as the principles are embraced and the appropriate level of investigation and assessment is undertaken.

## **Stages of IEM**

### Stage 1: Develop and Assess Proposal

*Development of the Proposal:* In order to encourage proponents to give early consideration to environmental issues in the planning and development of proposals, the following tasks are recommended:

- notify and consult with authorities and members of the public likely to be interested in, or affected by, the proposal;
- identify proposal alternatives, as well as environmental issues and community concerns associated with these alternatives;
- establish the policy, legal and administrative requirements applicable to the proposal, and
- consider possible mitigatory measures.

By undertaking these tasks at the initial stages of project planning, a more integrated and interactive approach to the planning and assessment of proposals will result, thereby expediting the process and facilitating informed decision-making.

*Classification of Proposal:* At the classification of proposal stage (referred to as Screening in some countries), the proponent determines whether the proposal follows the Impact Assessment, Initial Assessment or No Formal Assessment route.

a) *No Formal Assessment:* If the proposal meets planning requirements and the indications are that the proposal will not result in significant impacts, then the proposal is submitted for Review. The proponent and authority (who may invite

specialist or public review) must refer to the Summary List of Environmental Characteristics (see Table 1) before concluding that the proposal will require No Formal Assessment. Should the authority feel that additional information required in order to make an informed decision, he/she may request that an Initial Assessment be undertaken.

b) *Initial Assessment*: If the proposal is included in the List of Activities<sup>6</sup> or is located in the List of Environments,<sup>7</sup> (see Tables 2 and 3) and no significant impacts have been identified during the initial proposal generation stage, then an Initial Assessment must be undertaken. An Initial Assessment is also required in cases where uncertainty exists.

The Initial Assessment will typically be a brief investigation and involves obtaining just enough information to determine whether or not there will be significant impacts. Whether significant impacts are identified or not, an Initial Assessment report must be prepared. If the initial investigation concludes that significant impacts will result, then an Impact Assessment must be undertaken and the report will provide useful input to the Impact Assessment.

If there is a "finding of no significant impact" then responses to the questions contained in the Summary List of Environmental Characteristics (see Table 1) should form the basis of the report and should be submitted with any other relevant information (eg specialists' reports) that led to the finding of no significant impact.

It may also be possible during the Initial Assessment process to identify appropriate mitigatory measures which could reduce the potential impacts to acceptable levels, thus avoiding the need to undertake a full Impact Assessment. Adoption of these

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6. The List of Activities includes those activities which are likely to result in significant impacts (see Table 2).

7. The List of Environments indicates areas known to be sensitive, and easily disturbed or degraded by development activities (see Table 3).

mitigatory measures may form part of the conditions of approval (see Figure 1) and may be required as part of a Management Plan.

The authority may involve specialists and/or the public in the review process. Should the authority, or other reviewers, feel that further information is required, the proposal could be sent back for further investigation.

c) *Impact Assessment*: If it has become clear during the develop proposal stage that there will be significant impacts, or if the Initial Assessment indicates that the proposal will result in significant impacts, then an Impact Assessment must be undertaken. This is likely to be the case for proposals that are included in the List of Activities (see Table 2) or occur in the List of Environments (see Table 3).

- **Scoping**: Scoping is the most critical stage in the Impact Assessment process since it determines the extent of and approach to the investigation. The purpose of scoping is to focus the Impact Assessment so that only the significant issues and reasonable alternatives are examined. Fundamental to scoping is the involvement of relevant authorities and interested and affected parties. The scoping exercise also determines the procedures to be followed, and the particular requirements (for example, opportunities for public involvement) for the Impact Assessment. An opportunity to object to the scoping procedure followed, is also provided.

**TABLE 1: SUMMARY LIST OF ENVIRONMENTAL CHARACTERISTICS**

**Could the proposed development have a significant impact on, or be constrained by, any of the following?**

- Physical characteristics of the site and its surroundings
- Ecological characteristics of the site and its surroundings
- Current and potential land use and landscape character
- Cultural resources
- Socio-economic characteristics of the affected public
- Infrastructure services
- Social and community services and facilities
- Levels of present and future environmental pollution
- Risk and hazard
- Health and safety
- Cumulative and synergistic effects

**Could the proposed development be modified to significantly enhance the positive aspects of the above points?**

**Finally, in the light of the foregoing questions, a judgement should be made as to how well the proposed development meets the following criteria:**

- Will the proposed development be efficient when all social costs are taken into account?
- Will the proposed development be fair in the way different groups and individuals are affected?
- Will the proposed development be sustainable and in the interests of future generations?

*TAKEN FROM THE DEPARTMENT OF ENVIRONMENT AFFAIRS (1992)*

TABLE 2: LIST OF ACTIVITIES

<b>POLICY AND PLANNING PROPOSALS</b>	
1.	Structure plans (or, in the absence thereof, town planning schemes and zoning schemes).
2.	Rezoning applications.
3.	Subdivisions.
4.	Land acquisition for national parks, nature reserves, Marine reserves, protected natural environments or wilderness areas.
5.	Establishment of townships.
6.	Declaration of limited development areas.
7.	Any government policy on the use of natural resources.
<b>PROJECT PROPOSALS</b>	
8.	Nuclear installations.
9.	The formal disposal of waste.
10.	The transportation of hazardous substances and radioactive waste.
11.	Mining, mineral extraction and mineral beneficiation.
12.	Power generation facilities with an output of 1 megawatt or more.
13.	Electrical substations and transmission lines having equipment with an operating voltage in excess of 30 000 volts rms phase-to-phase.
14.	Storage facilities for chemical products.
15.	Industrial installation for the bulk storage of fuels.
16.	Bulk distribution facilities.
17.	Scheduled Processes under Schedule 2 of the Atmospheric Pollution Prevention Act (45/1963).
18.	Industries requiring a permit under section 12 of the Water Act (54/1956).
19.	Manufacture of explosives.
20.	Control Measures under section 6 of the Conservation of Agricultural Resources Act (43/1983).
21.	Battery and feedlot farming installations.
22.	Propagation of invasive alien plant and animal species.
23.	Afforestation projects.
24.	Genetic modification of organisms and release of such organisms.
25.	Major roads.
26.	Railways.
27.	Commercial aerodromes.
28.	Port, harbours and marinas.
29.	Major pipelines.
30.	Cableways and cableway stations.
31.	Television and radio transmission masts.
32.	Permanent racing and test tracks for cars and motor cycles.
33.	Major canals, aqueducts, river diversions and water transfers.
34.	Permanent flood-control schemes.
35.	Major dams, reservoirs, levees and weirs.
36.	Buildings with a total floor space of 500 square metres or more.
37.	Public transport mode transfer facilities.
38.	Establishment of armaments testing areas.
39.	Reclamation of land from the sea.
<b>TAKEN FROM DEPARTMENT OF ENVIRONMENT AFFAIRS (1992) LIST OF ACTIVITIES</b>	

TABLE 3: Extract from the LIST OF ENVIRONMENTS

<p><b><u>Designated areas or features</u></b></p> <ol style="list-style-type: none"> <li>1. Limited development areas.</li> <li>2. Protected natural environments.</li> <li>3. National, provincial and municipal nature reserves.</li> <li>4. Private nature reserves.</li> <li>5. Mountain catchment areas.</li> <li>6. Wilderness areas.</li> <li>7. National monuments.</li> <li>8. Shipwrecks.</li> <li>9. Archaeological and palaeontological sites.</li> <li>10. Graves and burial sites.</li> </ol> <p><b><u>Demarcated areas or features</u></b></p> <ol style="list-style-type: none"> <li>20. Estuaries and lagoons.</li> <li>21. Streams and river channels and their banks.</li> <li>22. Floodplains.</li> <li>23. Wetlands.</li> <li>24. Lakes.</li> <li>25. Dunes.</li> <li>26. Beaches.</li> <li>27. Reefs.</li> <li>28. Indigenous forests.</li> <li>29. High-potential agricultural land.</li> <li>30. Caves.</li> </ol>
<p>TAKEN FROM DEPARTMENT OF ENVIRONMENT AFFAIRS (1992) LIST OF ENVIRONMENTS</p>

- ***Undertaking the Investigation:*** The investigation is guided by the scoping process and should provide the authorities with adequate and accurate information on the positive and negative impacts of a proposal, and feasible alternatives, in a form that facilitates decision-making.
- ***Production of Report:*** The findings of the investigation must be documented in a report. Fundamental requirements of these reports are: integrated and accurate information, comprehensiveness, concise writing, and accessibility to non-specialists. To assist with the preparation and review of reports, Guidelines for Report Requirements have been prepared. These provide guidance on the format of reports and the aspects which should be covered in both the Impact Assessment and Initial Assessment reports.

## Stage 2: Decision

If the responsible authority is satisfied that sufficient information has been provided to make a decision, that adequate consultation has taken place and that the proposal complies with planning requirements, then a decision is taken. This decision could be to: approve the proposal (with or without imposing conditions), request that further information be obtained, or refuse approval. The preparation of an environmental management plan incorporating any conditions of approval may be required when granting a decision.

Guidelines to assist in the Review process have been prepared. These offer guidance on assessing the adequacy and completeness of reports, and provide guidelines for determining significance. A guideline document providing a Checklist of Environmental Characteristics has also been prepared to assist reviewers identify the environmental factors which may potentially be affected by development activities or which may place significant constraints on a proposed development. This list, whilst comprehensive, is not exhaustive and the reviewer may require the assistance of experts to assist in the review process. An opportunity exists for the Review of the Impact Assessment by the public and/or specialists, if requested by interested and affected parties during the scoping exercise.

Where the proponent is the decision-making authority, compulsory specialist review is strongly recommended. The decision that is taken, and the reasoning behind it, must be officially recorded in a Record of Decision document. This document should be made available to any interested party on request.

IEM makes provision for the proponent or an affected party to appeal to a higher authority against decisions taken. Should this appeal prove unsuccessful, legal provision must allow for appeal to a court of law.

### Stage 3: Implementation

Once approval is granted, the proposal may be implemented. In certain instances, the conditions of approval may require that a management plan and/or an environmental contract be drawn up. A Monitoring Programme should be implemented to ensure that the proponent adheres to the conditions of approval and complies with provisions in the Management Plan and/or environmental contract.

Periodic audits of the positive and negative aspects of implemented proposals should be undertaken. This will provide constructive feedback on the adequacy and effectiveness of IEM as an approach which seeks to achieve environmentally appropriate planning, and informed decision-making.

## CONCLUSIONS

This paper has reviewed the evolution of environmental evaluation procedures in South Africa. It has provided an historical perspective on the events that contributed to the development of IEM as well as some insights into the socio-economic and political factors which influenced the form of evaluation procedure eventually recommended for South Africa. The IEM procedure is a general approach to environmental assessment, planning and decision-making, and applies to a wide variety of activities including policies, programmes, plans and projects. Therefore, government departments and organisations responsible for undertaking or authorising specific activities (eg dams, subdivisions) should be required to develop and refine the IEM procedures and prepare guidelines appropriate to the planning, assessment and development of such activities.

For the successful implementation of IEM, it will be necessary to require mandatory adherence to the principles and procedures of IEM for all proposals likely to impinge on the environment. This could be immediately achieved through the declaration of an environmental policy in terms of Act 73 of 1989. In addition, the list of activities

identified in the guidelines as those requiring, at least, an initial impact assessment, should be identified by the Minister in terms of the Act (section 21). Authorisation of these activities would only be issued after an impact assessment report had been prepared and reviewed. Furthermore, the Environment Conservation Act should be amended to allow the Minister to declare areas or features as listed environments (see Table 3). By instituting the above proposals, professionals and authorities would be required by law to integrate environmental and public concerns into proposal formulation, assessment and decision-making.

Whilst certain planners in South Africa have expressed concern that the implementation of IEM may result in the duplication of existing planning procedures and practices, our review has shown that environmental considerations have not been an integral part of the planning and decision-making process. Where EIA's have been prepared, the trend has been for them to be undertaken as a separate activity, independent of the planning process. IEM does not intend to take over or duplicate the role of planning, but seeks to be a complimentary and integral part of the planning, design and decision-making process.

It has been stated that the success of any EIA process depends to a large extent upon the political context and the adequacy of existing institutional structures for planning and development control (Sorensen and West 1990). Thus, raising the level of awareness of political leaders regarding the need to incorporate environmental concerns in decision-making is a major challenge. Furthermore, the development of adequate administrative structures and the expansion and development of personnel to implement IEM are required. Given the broad similarity between the overall goals of environmental evaluation and planning, it is the authors' view that the administrative focus of IEM should be placed in an independent environmental planning agency. This agency would, amongst other tasks, be responsible for ensuring the integration of environmental issues in the planning process, providing guidance on undertaking impact assessments, and co-ordinating the review process. To ensure its effectiveness, this agency would require adequate resources, trained personnel and political credibility. In addition, it would have to have the legal and

political strength to enforce compliance by other government departments. Until such time as environmental assessment and planning procedures are amalgamated, it is essential that close liaison be encouraged between departments and professionals involved in environmental planning.

Whilst the refined IEM proposals were only published in June 1992, the general philosophy underpinning IEM and the guiding principles and procedures have been adopted by many South African professionals, authorities and political groups. The inclusion of the IEM proposals in the environmental policy of the African National Congress, as well as in policy statements of various government departments and NGO's is indicative of widespread support of the approach. This can be attributed to the extensive consultation programme followed in the latter years of developing and refining the IEM procedure.

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## PAPER 4

# IMPROVING THE PRACTICE OF PUBLIC PARTICIPATION IN ENVIRONMENTAL PLANNING AND DECISION- MAKING IN SOUTH AFRICA\*

## INTRODUCTION

A common theme throughout the planning and environmental impact assessment literature is the need for greater public participation in all aspects of planning, environmental assessment and decision-making (Hollnsteiner 1976; Hudspeth 1982; Potter 1985; Canter et al 1988; FEARO 1988; Burdge and Robertson 1990; Yap 1990). The rationale behind this call for public participation is the philosophy that in a democratic society, ordinary people should have the maximum opportunity to participate in actions and decisions which affect their lives. Yet the value and advantages of public participation go well beyond serving democratic goals.

In terms of furthering the goals of environmental planning, the key values of greater public participation are considered to be threefold. Firstly, it provides valuable information and insights into local conditions, as well as community needs, values and preferences. Secondly, broad participation throughout the planning process facilitates implementation of plans. Decisions based upon plans which have been generated by the people and which are reflective of community needs, values and concerns and take cognisance of environmental factors, are more likely to be considered legitimate, and thus supported by the people. Furthermore, the accountability of decision-makers is likely to be reinforced if the process is open to public scrutiny (Hudspeth, 1982). Thirdly, and possibly most importantly, participation in activities and decisions which directly impinge upon one's life, develops a sense

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of self-worth, responsibility and empowerment. Where participation is genuinely mass-based, it can contribute to increasing a community's self reliance and capacity (Hollnsteiner 1976; Moser 1989), and strengthen social cohesion.

While most public participation theorists recognise that there are problems associated with following a participatory approach (Hollnsteiner 1976; Canter 1977; Kent 1981; Hudspeth 1982; Potter 1985), the advantages - in particular the increased likelihood of gaining the support of the public - far outweigh these potential problems. In fact, experience has shown that failure to involve the public from the initial stages of project planning may lead to protracted decisions and delays in project implementation (Gawith *in prep*; CSIR Environmental Services 1993) and even court action (Sowman 1991), resulting in increased costs to the project proponent.

Despite the clear arguments for supporting public participation in all aspects of planning, there are several obstacles to its implementation. One of the major factors inhibiting a participatory approach to environmental planning and decision-making has been the undemocratic, technocratic and secretive style of government characteristic of many developing countries, including South Africa. Furthermore, this style of government has nurtured an elitist approach to planning (Sowman and Gawith *in press*), which advocates that those who are best qualified and technically most knowledgeable should be responsible for making societal decisions (Hollnsteiner 1976; Hudspeth 1982). This practice of planning *for* the people rather than *with* the people has restricted access to the planning process.

Some would argue that it would be foolish to advocate participatory planning where citizens do not have access to the decision-making process since it could lead to frustration (Kent 1981), or even violence (Moser 1989). However, evidence of the enormous power of public pressure to influence decisions and alter traditional processes suggests that decision-makers can no longer afford to exclude the public from planning and decision-making processes. In fact, these growing demands for active involvement have forced decision-makers and professionals to seek creative

means of providing increased opportunities for public involvement in the various stages of planning.

Parallel to this call for greater public participation in South Africa, has been a rise in environmental consciousness and a recognition of the detrimental effects of actions and decisions taken by politicians and administrative authorities on behalf of the public (Cock and Koch 1991; Ramphele 1991). Greater concern for environmental quality has led to increased questioning by the public and demands for access to information and participation in all aspects of environmental decision-making. There has been a concomitant rise in the number of non-governmental organisations (NGO's) concerned with environment and development issues (Khan 1990; HAP Organisational Development Services 1993) and significant increases in the membership of such groups. This has facilitated the organisation of individuals and groups with similar interests or problems and thus given a stronger voice and greater representation. These events have forced the planning professionals and government departments to afford the public greater access to the planning process.

However, whilst the principles of public participation appear to have been acknowledged in both developed and developing countries, the operationalisation of public participation is still relatively recent and needs to be further developed, implemented and evaluated. The central concern of this paper is, therefore, to suggest ways of broadening the scope and improving the practice of public participation in environmental planning and decision-making in South Africa. The paper begins by defining the concept and principles of public participation. It then briefly examines existing opportunities for participation in the legal and administrative system governing planning, environmental assessment and decision-making in South Africa. Suggestions as to how public participation may be better integrated into the environmental planning process are put forward. The role of the public, as well as the tasks of participation at each stage of the planning process, are outlined. Finally, a list of key techniques for facilitating public participation and an evaluation of their effectiveness, is given.

## DEFINITION AND PRINCIPLES OF PUBLIC PARTICIPATION

In South Africa the term public participation means different things to different people. Amongst certain technocrats, the existence of appointed bodies - such as the President's Council and Council for the Environment - through which the concerns of the public may reach policy and decision-makers, is considered a form of participation. To others, the notice-and-comment procedures, as required by certain legislation, such as the Land-Use and Town Planning Ordinances of the Provinces, provide adequate opportunity for the public to voice their objections. As far as the environmentally literate (mostly white elite) are concerned, public participation is a two-way communication process involving the exchange of information throughout the planning process, and the integration of the views of the public in the decision-making process (D Wilson, pers comm. Peninsula Mountain Forum). For those who are fighting for participatory democracy in South Africa, participation means citizen direction and control of the planning and decision-making process.

These various forms and levels of participation can be located somewhere on a continuum of participation categories varying from very constricted forms of participation through to various forms of joint decision-making and citizen control (see for example Arnstein 1969; Canter *et al.* 1988; Connor 1988; FEARO 1988).

Whilst the ultimate goal of public participation may be the transfer of decision-making power to the public (Hollnsteiner 1976; Kent 1981), we need to develop a working definition which reflects the needs and expectations of the people, but is also realistic and generally acceptable. In the context of environmental planning and decision-making, the following definition and set of principles is proposed. Public participation is:

1. an iterative, on-going communication process between an informed public and the professional team concerning the conceptualisation, development, assessment and decision-making of alternative proposals which affect the environment, and

2. a commitment by the participants (that is the public, professional team and decision-making authorities) to adhere to the agreed upon process and the outcome of that process.

The second part of this definition is critical during this transitional phase in South Africa, since it does not bind the participants to the traditional decision-making procedures, but to decision processes determined and agreed upon by all the participants at the outset of the planning exercise.

The key principles underpinning this definition are the following:

- Citizens have a fundamental right to become actively involved in the determination and outcome of any proposal affecting their lives and future;
- Involvement of all interested and affected parties, including NGO's, citizen groups, and government departments, should be actively sought and nurtured throughout the process;
- Public involvement should commence at the initial stages of plan formulation and continue throughout all stages to implementation and monitoring;
- There must be free and open access to information throughout the process;
- Participants must agree on an appropriate plan formulation and decision-making process, of which the public involvement programme constitutes an integral component;

- There needs to be a commitment by the various participants to the outcome of the process (so that no one group can override the final plans derived at through a participatory exercise);
- Mechanisms, such as appeal procedures for objecting to decisions taken which are not consistent with agreed upon procedures, must be set in place;
- There must be distribution of information, resources and development of skills to facilitate equitable participation of all affected parties.

## EXISTING OPPORTUNITIES FOR PUBLIC PARTICIPATION IN ENVIRONMENTAL PLANNING AND DECISION-MAKING IN SOUTH AFRICA

In this section, a brief review of the opportunities for public participation in legislative enactments and the administrative system governing environmental planning and decision-making, is given. The potential for achieving a measure of public participation through the establishment of informal arrangements between administrative authorities and the public, is explored. Since the form and level of participation discussed below is very restricted, the terms public input, comments, objections, appeal and review have been used to indicate the particular type of participation usually called for at the different stages of the planning process.

### **Provisions in Legislation for Public Participation**

In general terms, opportunities for public participation in key legislative enactments and provincial ordinances concerned with economic development, planning and environmental conservation, are limited to notice-and-comment procedures, written or oral representations, hearings and appeal procedures.

Before turning to the relevant acts and ordinances, it is pertinent here to comment on the opportunity for public input in the preparation of parliamentary legislation and provincial ordinances. There is no constitutional requirement that all proposed legislation be published for comment before promulgation. Thus, it is interesting to note that certain recently promulgated key laws, relevant to land use planning, development and environmental conservation, most notably the Environment Conservation Act 73 of 1989, the Physical Planning Act 125 of 1991 and the Cape Land-Use Planning Ordinance 15 of 1985, have all been published for general information and comment prior to publication. Changes to the legislation have occurred as a result of input received from the public and authorities. However, there is no legal requirement that the public comments and concerns submitted be addressed when revising the draft legislation.

The Environment Conservation Act 73 of 1989, in particular, was preceded by extensive deliberations and ample opportunity for public comment (Rabie 1990). The Act itself, also provides several opportunities for public input, mostly in the form of notice-and-comment requirements [see for example, section 32 (1) and (2)]. In fact, Rabie (Fuggle and Rabie 1992) believes that Act 73 of 1989 provides greater opportunities for public comment and representation, in terms of administrative decision-making, than any other legislation. However, a major shortcoming of these provisions is that the Act does not specifically require the relevant administrative authority to take account of the comments and/or objections received in the decision-making process. The only exception to this is Section 23 (4) which requires that all representations received, in terms of the declaration of a Limited Development Area, be considered.

A further opportunity for the public to gain access to the decision-making process is afforded in Section 36 (1) and (2), which enables any person whose interests are affected by an administrative decision made in terms of this Act, to request the administrative body concerned to furnish reasons for the decision. Furthermore, the Act makes provision for the applicant to apply to a division of the Supreme Court to

review the decision once such reasons have been provided, or if the administrative body fails to furnish reasons, within a stipulated time period.

What limits the benefits of these enhanced opportunities for public input is the Acts restrictive *locus standi* requirement which limits "participation" to those persons (such as property owners and developers) whose individual interests have been directly affected by an administrative decision. A further criticism of the Act, and which is contrary to participatory principles, is the enormous powers vested in the Minister and other delegated authorities. Thus leaving ultimate control of environmental matters in the hands of the executive (Fuggle and Rabie 1992).

The new Physical Planning Act 125 of 1991, unlike its predecessor, the Physical Planning Act 88 of 1967, contains extensive provisions for the public to provide input at particular stages of the planning process. This includes provisions for the public to submit written proposals for inclusion in draft plans, to comment on draft plans, to inspect policy plans, to be informed of investigations into a particular matter, to make application to the planning authority to amend a policy plan, and to review final plans [see sections 9, 10 (2), 11 (1) (2), 14, 15, 18, 19 and 20]. The requirement that proposals and comments from the public be considered by a planning committee prior to preparation of a draft plan [see section 10 (1)] and by the planning authority prior to approving a plan [see section 15 (2)], means that public concerns and input will be considered in plan formulation. Furthermore, failure to do so would strengthen the public's case should a decision to proceed with a plan be challenged in a court of law.

Surprisingly, the section dealing with urban structure plans contains no clear provisions for public participation, although an administrator may provide such opportunities in regulations dealing with the manner in which an urban structure plan is required to be prepared [see section 26 (1)].

Whilst several sections of the Act provide opportunity for public input in the plan preparation process, the effectiveness of the type of participation afforded in the Act

is extremely limited. Firstly, the members of the planning committees, who are responsible for the preparation of plans, as well as the investigating committees, are appointed by the planning authority. There is no requirement that representatives of the public or communities whose interests may be affected by the plans, serve on these committees. Consultation with members of the public is usually at the discretion of the planning authority, as is the approval, amendment, review and withdrawal of policy plans.

Finally, methods of notifying the public of opportunities to comment or submit representations are extremely limited since the notices informing people of this opportunity are either published in the government gazette, and/or in an Afrikaans and English newspaper circulating in the area. This limited notification procedure effectively restricts input to those who are literate, fluent in either English or Afrikaans, and who have the resources to obtain the newspaper or gazette. Furthermore, even if persons or communities affected by a plan were notified of an opportunity to comment on a draft plan, via other means such as radio, or notices displayed in the community, only few would have the knowledge and skills to review the document and plans, and be able to comment from an informed position (Sowman and Gawith *in press*).

A review of the various provincial town and land-use planning ordinances, reveals that various provisions exist for limited public participation. These include opportunities to:

1. comment on draft plans;
2. submit written representations or objections in the case of new or amended town planning schemes, the establishment of townships, rezoning and subdivision applications, and
3. appeal against decisions.

It would appear that the Natal Town Planning Ordinance 27 of 1949 offers broader scope for public input and comment, since provisions exist for hearings and public meetings to be held, broad advertising of proposals and invitations to comment, as well as the serving of notices on persons directly affected by a plan or development application. However, these participatory provisions are limited in scope, since the extent of their application is often left to the discretion of the Town and Regional Planning Commission (T&RPC), which is mainly concerned with efficiency considerations, and has time constraints and limited resources. Furthermore, the decisions made by Natal T&RPC are subject to the approval by the Executive Council of the Natal Provincial Administration. This is a politically appointed Council who do not have to furnish reasons for their decisions.

The adequacy and effectiveness of these various provisions in achieving the goals of public participation are generally very limited, since they are mainly concerned with providing the public (and mostly only a limited public) with an opportunity to comment on plans which have been formulated, approved and implemented by others.

There are various other acts and ordinances which deal with activities and matters which clearly have implications for environmental planning such as the Minerals Act 50 of 1991, the State Land Disposal Act 48 of 1961, the Less Formal Townships Establishment Act 113 of 1991 and the Subdivision of Agricultural Land Act 70 of 1970, to name but a few. A broad-brush review of these and other relevant pieces of legislation, indicated that provisions for public participation are either severely restricted or non-existent.

### **Opportunities within the Existing Administrative System for Public Participation**

According to Schwella and Muller (1992), except for the appointed councils and statutory bodies - which in terms of the various public participation typologies would be considered a form of non-participation (Arnstein 1969; Connor 1988; FEARO

1988) - there are few formal institutionalised opportunities for real participation by the public in environmental management decisions. In fact, the system of Apartheid has resulted in an extremely complex and cumbersome administrative system characterised by bureaucratic, secretive and technocratic procedures and approaches, as well as the granting of excessive powers to government officials who are not accountable for decisions taken. Furthermore, many government officials still regard the involvement of the public in administrative activities and decision-making as being undesirable, since it may result in project delays and increased costs. These characteristics and attitudes are contradictory to the principles of participation. It is therefore inevitable that until the style of government changes, opportunities for real participation in public administration will not be formally required.

Many authors would argue that the concept of public participation, in the form of the principles of natural justice, is implicit in administrative law - a branch of law concerned with the administrative process itself and the judicial control of that process (Baxter 1984; Baxter and Milton 1986; Fuggle and Rabie 1983; Little 1989). The principles of natural justice require that any person who is disadvantaged by an administrative action should be given a fair and impartial hearing by a court of law before the action contemplated is taken (Baxter 1984). However, since this remedy is usually invoked once a decision has been taken, it falls short of meeting the goals of participation and acts merely as a form of external control of administrative actions. Furthermore, as far as serving the public and environmental interest is concerned, the review process is severely restricted since the courts can adjudicate only on the validity and legality of actions taken (Fuggle and Rabie 1992), and cannot consider the substantive correctness of decisions taken. It is the merits of a decision that are usually the concern of the public.

The most serious shortcoming of this remedy is, however, the extremely limited interpretation of the *locus standi* requirement. This immediately limits access to the courts to those persons who can demonstrate a direct, personal and sufficient interest in the action concerned (Baxter 1984). For this remedy even to be

considered a form of public participation the *locus standi* requirement would need to be significantly liberalised.

A remedy which affords the public an opportunity to challenge the merits of an administrative decision is known as appeal. Appeals can be made either to a court of law or to a designated administrative body. However, this remedy can only be employed if provision for appeal exists in the legislation. In the case of appeal to the executive, the legislation usually makes provision for appeal to a higher level of authority in the same administrative hierarchy (Fuggle and Rabie 1992). For example, provision exist in the Natal Town Planning Ordinance 27 of 1949 for an aggrieved person to appeal to the Town Planning Appeals Board against a decision (see Sections 67 and 73). Once again, the interpretation of aggrieved person may be narrowly interpreted, limiting the effectiveness of this remedy to the general public.

### **Opportunities Provided by Informal Arrangements and Agreements**

One of the more effective means of obtaining public participation in administrative actions and decisions, is through establishing informal arrangements and agreements between administrative authorities and the public. Community organisations such as Ratepayers' and Civic Associations (committees that are representative of communities and stakeholders in a particular area or affected by a particular proposal), as well as community advisory groups, are the kinds of structures that have been set in place to provide a forum where policy, planning and development-related issues affecting the environment may be discussed, negotiated and resolved.

Over time, procedures for ensuring that the public provides input to the planning and decision-making process are likely to develop as it becomes increasingly recognised as necessary and desirable by both the decision-making authorities and the affected communities. One such example is the Development Sub-committee of the Hout Bay Ratepayers' Association - a resident's advisory group comprising a multi-disciplinary

team of professionals, including planners, architects, engineers, environmentalists, social scientists, estate agents and developers. Before any planning or development proposals for the Hout Bay local area are approved or rejected by the Western Cape Regional Services Council (WCRSC), the local authority for the area, they are submitted to the Development Sub-committee for consideration and review. Members of the Sub-committee will usually make recommendations to the WCRSC after they have reviewed the application, visited the site and, where necessary conducted their own investigations. This Sub-committee then reports to the Executive Committee of the Hout Bay Ratepayers' Association, which also provides comments. In the case of controversial proposals, a public meeting is usually held. Although this approach tends to encourage proponents to incorporate environmental and community concerns throughout the planning process, the sub-committee may recommend that an environmental impact assessment (EIA) be undertaken for proposals that are likely to result in significant impacts.

This Sub-committee has also prepared a set of guidelines for developers indicating the type of information that should be provided with an application, and encouraging them to meet with the Sub-committee members prior to developing their proposals. The purpose of these initial meetings is to identify issues of concern to the community, environmental constraints associated with the proposal, reasonable alternatives as well as the kinds of trade-offs that would be acceptable to the community. The WCRSC routinely refers all potential developers and applications to the Sub-committee and is guided by the recommendations of the Sub-committee when making decisions.

The purpose of providing this detailed description of the composition and *modus operandi* of the Development Sub-committee is not to set it up as a model structure for public participation - for that it is not. Rather, it serves to illustrate the kind of informal arrangements and agreements that exist between administrative authorities and the public. The effectiveness of such informal arrangements depend to be a large extent on the attitudes of individual officials and government departments to

public participation, as well as the capacity of the public to organise themselves and constructively contribute to decisions which affect their lives.

What is evident from this brief review is that, whilst certain legislative provisions, administrative procedures and informal arrangements exist which require some form of public participation, they are extremely restricted in terms of who participates, the nature and method of participation and at what stage of the planning and decision-making process participation occurs.

## A PROPOSED PUBLIC PARTICIPATION PROCESS

Although the literature abounds with calls for increased public participation in all aspects of planning, environmental assessment and decision-making, information and guidance on the means by which this may be operationalised, is scant. A key message to emerge is that the process of planning is as important as, if not more important than, the outcome (Kent 1981; Committee of Urban Transport Authorities 1990; Kraybill 1992). Involving the public in all stages of the planning process creates a climate of trust, ownership and legitimacy. This includes involving the public in determining an appropriate planning process for the particular project, designing a public involvement programme, as well as identifying appropriate structures to guide and support the process. Under these conditions, the public will be more willing to leave the technical details and design to experts.

In the final two sections of this paper, an attempt is made to show how this increased participation may be achieved in practice. It proposes a public participation process indicating:

- when, or at what stage of the planning process, participation is required;
- how, or the means by which, public participation may be achieved, and

- why, or for what purpose the public should be involved in the activities of environmental planning and decision-making.

Before turning to examine how the dynamics of a participatory process may be achieved in reality, it is necessary to clarify and define the environmental planning process. From the literature there appears to be a degree of consensus about the nature of plan-making and the key stages in the planning process (Wood 1988; Committee of Urban Transport Authorities 1990). These key stages are diagrammatically represented in Figure 1. Environment goals and considerations are often either explicit or implicit to this planning process (Whitaker 1984; Wood 1988; Armour 1990). However, the failure of planning to adequately address environmental issues was one of reasons for the introduction of EIA, an activity designed to identify, assess and communicate the environmental consequences arising from any proposed policy, programme, plan or project. Ultimately both activities are concerned with the appropriate allocation, use and development of resources to create better living environments and so enhance the quality of life.

Given the complementarity between the goals of EIA and planning, academics and practitioners are calling for the integration of these two processes, rather than undertaking an EIA as a separate activity (Whitaker 1984; Wood 1988; Fuggle 1990; Armour 1990; Brown 1990). Worldwide, the thinking and trend is to merge the activities of EIA and planning - hence the term environmental planning. Certainly, the recently developed Integrated Environmental Management (IEM) system (Department of Environment Affairs 1992; Sowman et al *in press*) seeks to facilitate the merging of these two processes, although IEM tends to place more emphasis on the assessment stage of environmental planning.

Whilst many environmentalists in South Africa would argue that existing planning procedures and approaches fall short of EIA requirements (Retief and Bosman 1984; Sowman 1988; 1991; Preston 1993), for the purposes of this paper we will assume a greater commitment to the incorporation of the principles and activities of EIA in

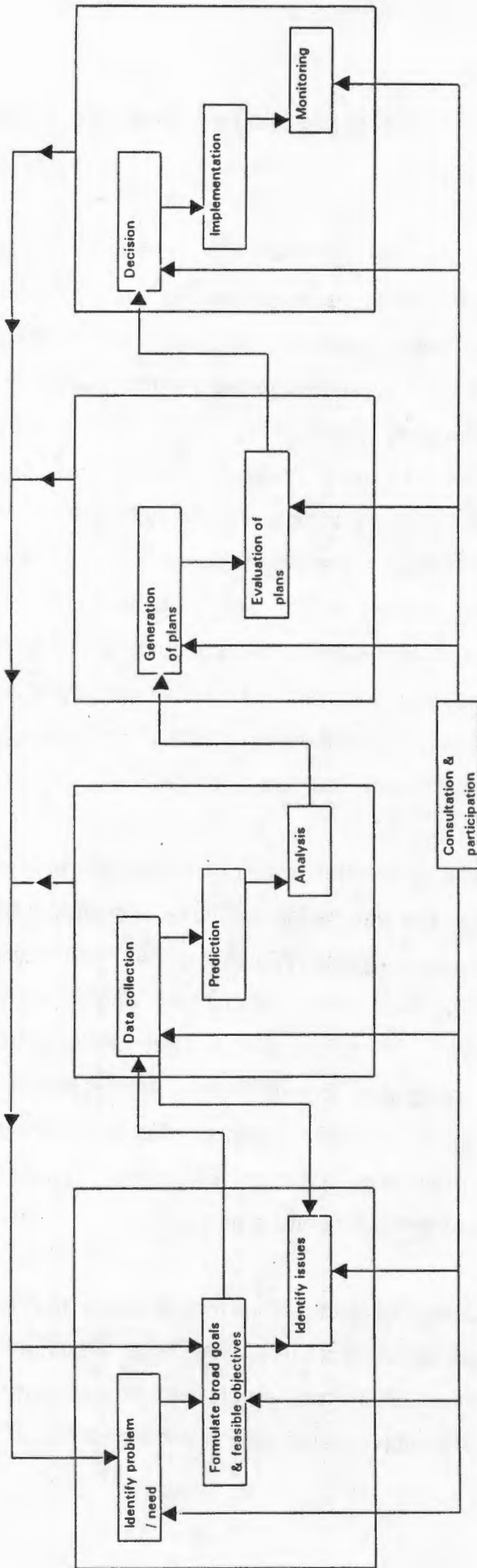


Figure 1: Key Stages in the Plan-Making Process (Adapted from Wood, C in Wathern ed. 1988).

plan-making than is actually the case. Hence the use of the term environmental planning in this paper.

A more detailed examination of the various stages of the environmental planning process (see Figure 2) allows one to consider at what stage, in what way and for what purpose the public may be more involved in the environmental planning and decision-making process. Figure 2 provides a detailed step-by-step account of the environmental planning process. The typical stages in the EIA process which would parallel the planning process, are also indicated. A brief description of the nature and tasks of public involvement at each stage of the environmental planning process is provided.

In summary, public participation begins at the problem identification stage (refer Figure 2, Stage 1). The problem or need requiring a planning solution may be identified by the public or an authority. Where a problem or need has been identified by the authorities or politician, the public should participate in clarifying the nature of the problem, and together with the planners and authorities, produce a broadly accepted definition of the problem. One of the first tasks for the public would be to assist with the identification of broad goals and specific objectives for the planning exercise. It is likely that these goals would be reworked and refined in the course of the planning process.

During Stages 2 and 3 of the environmental planning process (Figure 2), the public, together with the planning team would determine an appropriate environmental planning and decision-making process to address the particular problem under consideration. This would include the development and design of a public involvement programme. It is likely that at this point, a representative group of people would be mandated to deal with most of the public participation tasks and the broader public would only be involved as determined by the agreed process. Other key tasks for the public during Stages 2 and 3 would be the identification of possible alternatives, the identification of issues and environmental impacts, as well as community values and concerns requiring consideration and investigation. Access

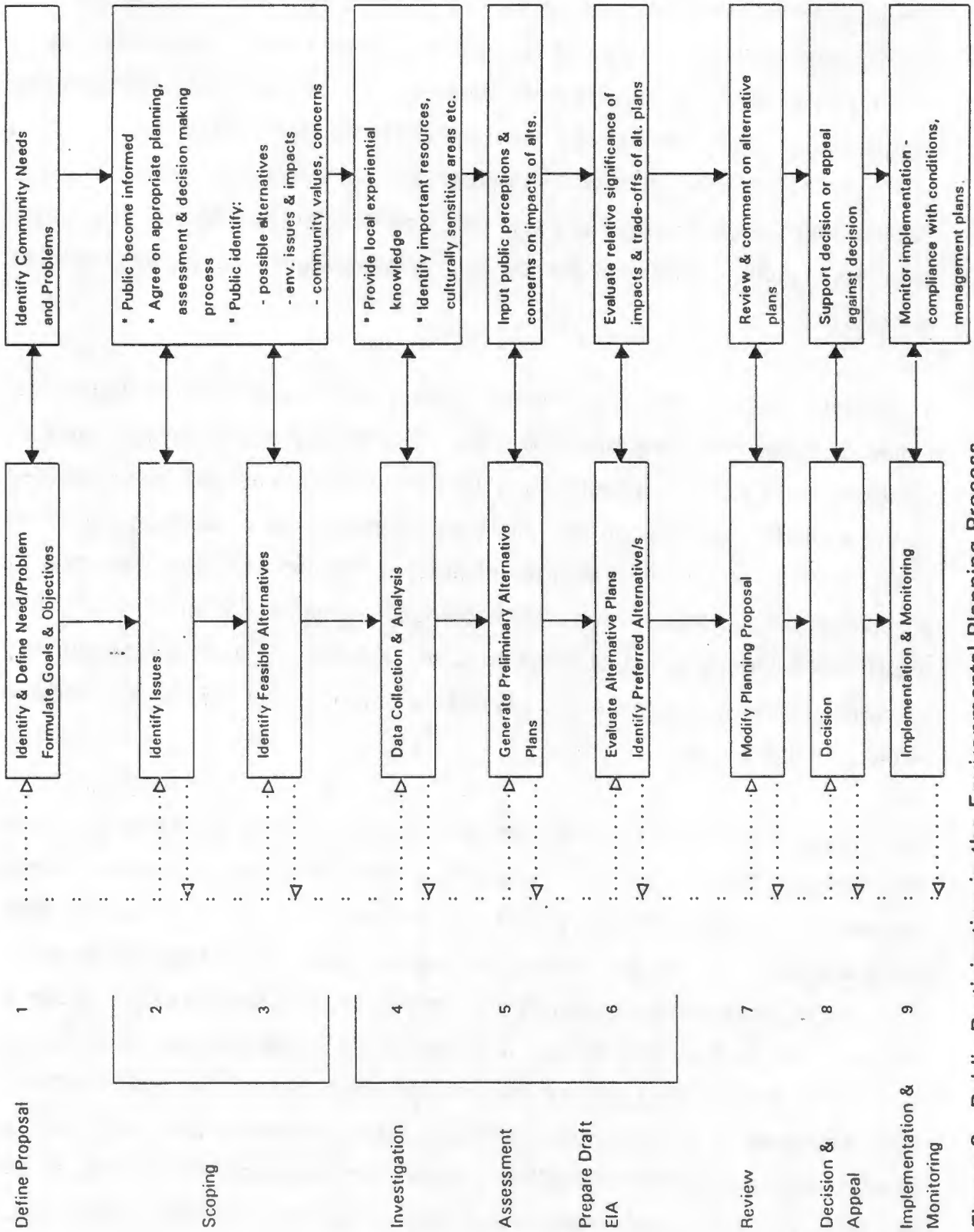


Figure 2. Public Participation in the Environmental Planning Process

to information as well as appropriate dissemination and communication of information to the public is fundamental to such a participatory process.

The role of the public during Stage 4 of the environmental planning process is to provide local information and experiential knowledge, and identify important resources and features, as well as environmentally and culturally sensitive areas and issues. The local public could also assist in predicting future conditions with and without the planning intervention. During Stage 5, obtaining information on public perceptions and concerns regarding the anticipated positive and negative impacts associated with the proposed alternatives will assist planners with the generation of preliminary alternative plans.

The next task for the public would be to assist in the evaluation of the alternative plans (refer Stage 6). By using appropriate evaluation methods, the public should be asked to evaluate the relative significance of the impacts and trade-offs associated with the various plans. The public's input here should significantly influence the identification of the preferred plan.

The public should then be given an opportunity to review and comment on the draft plans and documents, which may include an EIA report (see Stage 7). By addressing and incorporating relevant public comments, the plans and documents will be modified and the final plans drafted. Should the public be involved in the process as outlined above, it is likely that at this stage a preferred plan will be readily identifiable and that the decision, however derived, will be the logical outcome of the process. Detailed design of approved and supported plans would then follow (see Stage 8). However, should a decision be imposed which does not reflect the decision arrived at through the described participatory process, the public could then appeal against the decision.

Finally, the public's involvement during and after implementation of the plans would be to monitor the implementation phase and ensure compliance with any conditions

imposed, adherence to management or rehabilitation plans and to provide feedback (see Stage 9).

Whilst figure 2 suggests that the environmental planning process follows a logical sequence, in practice this process represents a series of iterative steps involving feedback as new information and insights are obtained, giving rise to modified plans and the possible consideration of additional alternatives. In addition, active involvement of the public from the initial stage of problem identification and plan conception may result in a different sequence of steps which they consider to be more appropriate for the resolution of an identified problem or need. The public participation process outlined above may create the impression of providing excessive opportunities for public involvement in every aspect and activity of environmental planning. However, it must be stressed that the nature and extent of public participation will be determined by the process that is agreed upon by the public at the outset of the exercise. In practice, it is likely that most of the negotiations will take place with a group of people representing interested and affected public, and involvement of the general public will be limited to stages such as the review process.

The process proposed above is merely a guide which the public, professionals and authorities can use to assist in designing a public participation programme to suit their particular circumstances.

## METHODS AND TECHNIQUES FOR FACILITATING PUBLIC PARTICIPATION

The previous section provided some guidance on how to incorporate public participation throughout the environmental planning and decision-making process. In this final section, a brief discussion on, and summary of, the methods and techniques that can be employed to achieve the tasks of public participation at the various stages of planning is provided. From a literature review and from experience

it is clear that there is no one method or technique that is adequate and effective for the variety of tasks required of a participatory process.

Furthermore, the choice of methods used would depend on several factors, such as the degree of homogeneity amongst interested and affected communities (see Department of Environment Affairs 1992), as well as the capability of the method to perform the task set for it. For example, in the review stage, under certain circumstances it may be appropriate to advertise in local newspapers that draft plans and documents are available in the local library for scrutiny and comment. However, in other situations, where for example the public includes poor and illiterate people, it may be more appropriate to hold a series of workshops in the community to discuss the draft planning proposals (which ideally would have been derived from the communities inputs thus far), and obtain comments.

Given the numerous papers, manuals and guidelines which provide information on the various methods and techniques of public participation as well as their strengths and limitations (Creighton and Delli Priscoli 1983; Connor 1985; Potter 1985; FEARO 1988; Committee of Urban Transport Authorities 1990; Department of Environment Affairs 1992), only a summary of the most widely used methods are provided in Table 1 of this paper. An indication of the utility and effectiveness of these methods in terms of certain evaluation criteria - such as problem solving ability or the amount of resources required - is also tabulated (see Table 1). These evaluation criteria are defined more fully in Table 2 and have been developed from those used to evaluate selected participation techniques proposed for the Canadian scoping system (Ministry of the Environment, Ontario 1985). An earlier version of this table can be found in the IEM scoping guidelines (Department of Environment Affairs 1992).<sup>1</sup>

The selection of an appropriate participation technique for the particular stage in the planning process is a matter of judgment which is made easier with experience.

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1. The author was one of the researchers involved in developing the IEM procedure and preparing the Scoping Guidelines

Table 1: Participation Techniques

TECHNIQUES	AUDIENCE SIZE	EXPERTISE REQUIRED	RESOURCES REQUIRED	INFORMATION EXCHANGE	EDUCATION POTENTIAL	PROBLEM SOLVING VALUE	ISSUE IDENTIFICATION	PERFORMANCE WITH DIVERSE GROUPS	PERFORMANCE WITH DISADVANTAGED GRPS	FACILITATES EMPOWERMENT
MEDIA ADVERTISING	large	medium	medium	low	medium	low	low	low	low	low
EXHIBITS/ DISPLAYS	medium to large	low	medium to high	low	low to medium	low	low	low to medium	low to medium	low
WRITTEN INFORMATION	medium to large	medium to high	medium	medium	medium to high	low	low	medium	low to medium	low
PHONE LINES	large	medium	low	medium	medium	low	low	medium	low	low
OPEN HOUSE	large	medium	medium to high	high	high	low to medium	medium	medium	low	low
FIELD OFFICE / SITE VISIT	medium	low to medium	medium	medium to high	medium to high	low to medium	medium	medium	medium	low
PUBLIC MEETINGS	large	medium	low to medium	low to medium	low	low	medium to high	low	low	low
SURVEYS	small to large	high	medium to high	medium	medium	low to medium	medium to high	medium	low to medium	low
DELPHI / NOMINAL GROUP TECHNIQUE	medium	medium to high	medium	medium	medium to high	medium	high	medium	low	medium
WORKSHOP / SMALL GROUP DISCUSSIONS	medium to large	high	medium	high	high	medium to high	high	high	high	high
ADVISORY / TASK GROUPS	small	high	medium	high	high	high	high	medium	medium	medium
CHARRETTES	medium	medium	medium	high	medium to high	high	high	medium	unknown	medium
ARBITRATION / MEDIATION	small to medium	high	medium	high	medium to high	high	medium to high	medium to high	medium	medium to high
NEGOTIATION	medium	high	medium	high	high	high	high	high	high	high

Increasing levels of participation



**Table 2: Evaluation Criteria for Table 1**

<b>Audience Size</b>	Small 1-15; Medium 16-50; Large 51 +;
<b>Expertise Required</b>	Skills required by the proponent/consultant to facilitate participation - such as facilitation and group interaction skills, questionnaire design experience etc.;
<b>Resources Required</b>	Resources such as time, person power and funds required to achieve participation objectives;
<b>Information Exchange</b>	The potential for information exchange and public input into the various stages of proposal planning, assessment and implementation;
<b>Education Potential</b>	The potential to raise the level of awareness and understanding of issues, impacts and concerns, amongst all participants;
<b>Issue Identification</b>	Potential to identify contentious and significant issues associated with the proposal;
<b>Problem Solving Value</b>	The potential to resolve problems and assist in the resolution of outstanding issues;
<b>Performance with Diverse groups</b>	Ability for information exchange where diverse communities are involved;
<b>Performance with Disadvantaged Groups</b>	Ability to involve representative members from disadvantaged communities;
<b>Facilitates Empowerment</b>	Potential to develop a sense of responsibility, self-reliance and empowerment.

However, once the "public" have been identified and invited to participate in the process (using whichever method(s) is/are considered most appropriate for this task), the participants themselves can assist in identifying which techniques would be most appropriate for which "publics", for what tasks and at what stage of the environmental planning process. The development and documentation of case study material which reports on public involvement methods employed and their strengths and limitations, would greatly contribute to improving the practice of public participation in environmental planning and decision-making.

## CONCLUSIONS

Despite the recognition of the values and advantages of public participation worldwide, there is little guidance on when, how, for what purpose and to what extent the public should be involved in the environmental planning and decision-making process. South Africa, with its history of Apartheid, has been particularly slow to create opportunities and implement procedures for public participation in this field. However, the trend towards participatory democracy in South Africa will require responses from planning professionals, environmentalists and those in decision-making positions, which are indicative of an open and participatory approach.

Having defined the concept and discussed the principles underpinning public participation, this paper presents a public participation process which parallels the environmental planning process. It provides guidance on how to determine the nature and extent of public involvement, what tasks the public should be involved in at each stage of the planning and decision-making process, as well as the suite of methods available to facilitate such a participatory process.

Whilst the nature and extent of public participation will vary from project to project, it is crucial that the public be integrally involved in determining and designing the public involvement programme at the outset of the planning process. Such a participatory process has a high probability of success since it provides a better

information base, creates a sense of ownership, trust and control amongst those affected by the proposal, promotes perceptions of equity, legitimises the decision-making process and encourages accountability.

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## PAPER 5

# PARTICIPATION OF DISADVANTAGED COMMUNITIES IN PROJECT PLANNING AND DECISION-MAKING: A CASE STUDY OF HOUT BAY, CAPE\*

### INTRODUCTION

In South Africa there has been very little opportunity for public participation in decisions taken on matters affecting the environment and quality of life. The South African style of government has traditionally been highly centralised, deeply authoritarian and secretive (Boulle, 1990). This is particularly true in terms of "black" population groups. The apartheid system was designed to exclude the majority of South Africans from political participation, and thus necessitated the development of administrative, legal and social structures which prevented people from effectively participating in matters which affected their day-to-day lives. South Africans in general, and "black" South Africans in particular, have consequently developed an apathetic attitude towards environmental decision-making which has stemmed from the powerlessness experienced in the political and decision-making arenas.

The approach to planning in South Africa received its impetus from early planning in Britain, which was dominated by "efficiency concerns". Planning thus came to be dominated by applied scientists such as architects and engineers who held the view that most planning problems had technical solutions (McCarthy and Smit, 1984). The system of apartheid nurtured this elitist approach towards planning. Planning decisions, were thus the exclusive domain of professionals and decision-making authorities, including politicians, lawyers and administrators (Rabie and Erasmus, 1983; van Zyl, 1987; Sowman, 1988; Boulle, 1990). These players have held the view that it is those who are best qualified and technically most knowledgeable, who

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\* Paper accepted for publication in *Development Southern Africa*

environmental and societal matters (Hollnsteiner, 1976; Hudspeth, 1986). Such an approach has further removed decision-making processes from the broader public and politically marginalised groups, and has in turn served as a basis upon which the set of social relations, specific to South African society, might have been justified.

Opportunities for public involvement in legislation and public administration have thus been extremely limited. Input from politically marginalised groups and local communities, who may have insights and knowledge to contribute, have thus far been largely ignored, in efforts to deny access to the decision-making process.

The notion of a transparent, democratic and participatory approach to environmental planning and decision-making is contradictory to apartheid ideology and such an approach to planning has therefore been slow to emerge. However, a growing insistence amongst the public, particularly disadvantaged<sup>1</sup> communities, of their right to be consulted on decisions which affect their living circumstances, has forced decision-makers to seek ways of involving affected communities in the planning and decision-making process. Service and community organisations such as civic<sup>2</sup> associations, in both rural and urban areas, are playing an important role in transforming decision-making processes through increasingly demanding a role in planning decisions. The recent refusal by communities to participate in projects which have been planned for them, or imposed upon them, has forced planners and decision-making authorities to review their approaches and include participation as a component of project planning (Swilling, 1988; Committee of Urban Transport Authorities, 1990). Recent changes to Government policy in South Africa bear testimony to this pressure, as opportunities for increasingly decentralised decision-

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1. Disadvantaged communities are communities which have been denied access to the political process and as a result have had restricted use of and access to resources and educational opportunities. For these reasons there is a high level of illiteracy in these communities.
  2. Civic associations are democratically elected organisations which provide alternative and legitimate structures for local government in many "black" communities in South Africa. These new forms of popular government are also referred to as embryonic "organs of peoples power" (Swilling, 1988).

making processes are evolving. In certain areas, failure to involve communities in decision-making has resulted in the breakdown of state control, followed by a period of social and administrative disruption. However, where representative, capable and committed leadership exists, alternative and legitimate administrative structures have emerged (Swilling, 1988).

As socio-political circumstances change in South Africa, and along with them popular expectations and development priorities, planning and development actions will be forced to involve those communities which are likely to be affected by proposed developments. An obvious example is the identification and allocation of land, and the provision of housing and services for low-income communities.

This paper reflects on the experiences and findings of a research project conducted in an informal settlement in Hout Bay, in the Cape Metropolitan area, over the past three years. The central aim of the project has been to examine the way in which environmental and community concerns and perceptions have been integrated into the planning process. In particular, we were interested to examine and assess the effectiveness of methods employed to involve disadvantaged communities in the planning and decision-making process.

The participatory research approach (Ramphela, 1990) employed, facilitated the development of a collaborative relationship between the researchers and the community which allowed the use of techniques such as house meetings to be undertaken jointly between members of the Civic Association and research team.

In this paper, we focus on some of the challenges surrounding the involvement of disadvantaged communities in environmental planning and decision-making, using Hout Bay as a case study. We argue that it is only through effective participation in planning decisions, that acceptable solutions respected by all parties involved, will be found. Difficulties in addressing these issues must be acknowledged and understood, and creative means of overcoming these challenges must be sought. Practical suggestions regarding appropriate methods and techniques of public participation in such situations are put forward.

We begin by providing a brief historical perspective on informal settlements<sup>3</sup> in Hout Bay and then identify and discuss issues to be considered in facilitating a participatory approach to planning and decision-making in such communities. The paper is written in a narrative style to provide the reader with insights of the project process as it unfolded.

## BACKGROUND TO THE HOUT BAY CASE STUDY

Hout Bay is a semi-rural coastal residential area in the Cape Town Metropolitan Area (Figure 1). It is geographically isolated from the rest of the Cape peninsula, situated in a scenic valley and enclosed by mountains and the sea. Space is limited by the physiography of the valley. The Hout Bay community has evolved over the years from a small rural fishing and farming community to an upper income mainly "white" residential suburb of Cape Town. Tourism is now a major revenue earner for the local Hout Bay economy.

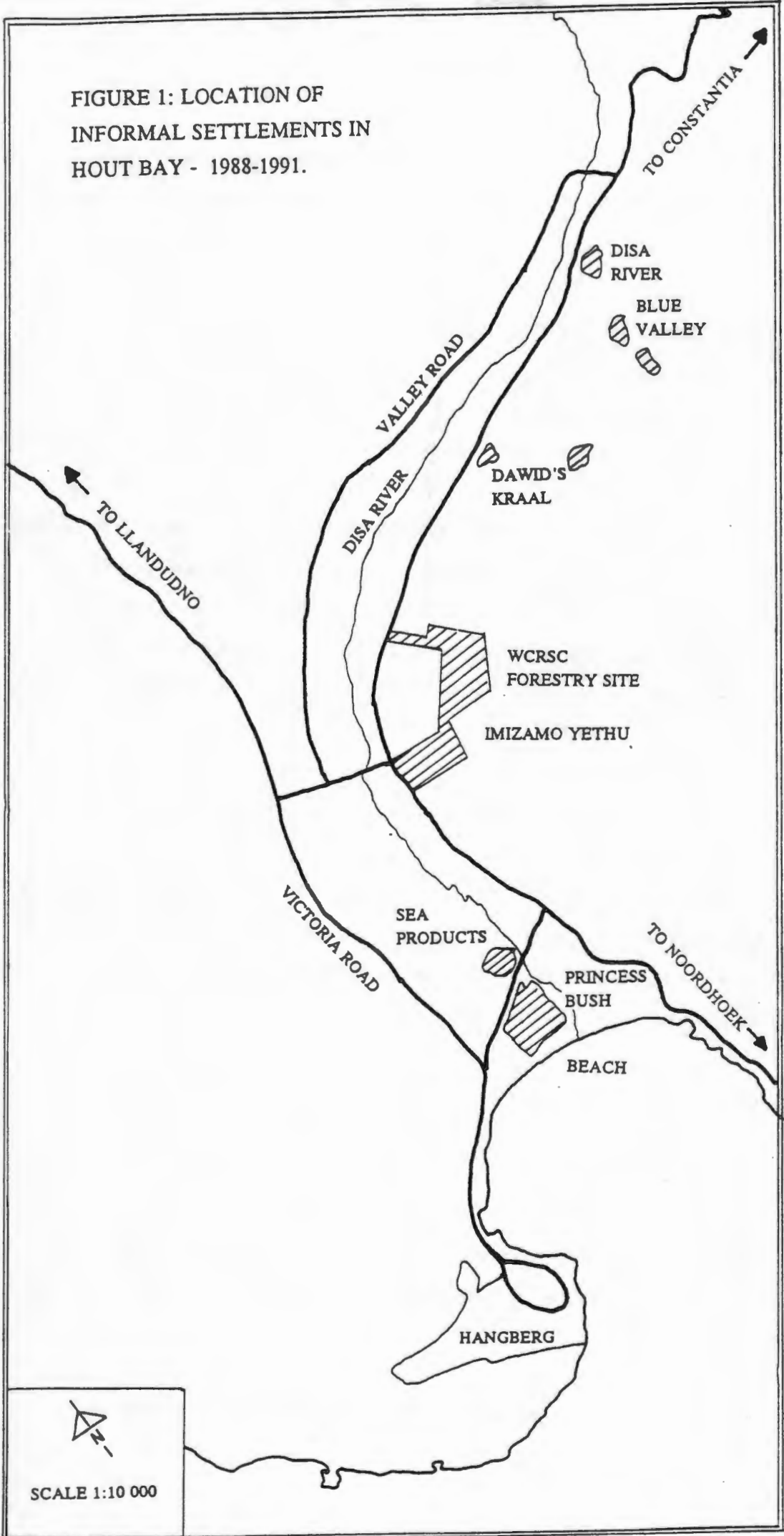
The valley has long been the home of a fluctuating informal community who established themselves in a number of informal settlements in the Hout Bay valley. The emergence of these informal settlements can be seen as a direct response to the inadequate provision of land and housing for the resident "coloured" and "black" labourers of Hout Bay's fishing and early agricultural industries.

In 1956, the Group Areas Act No. 41 of 1950 was implemented in Hout Bay. The Act was fundamental to apartheid planning policies in South Africa in that it served to entrench the structural divisions in society through the physical separation of different racial and economic groups. Hout Bay was designated a residential area for "white" ownership and occupation. Only two percent of the land in Hout Bay, in the vicinity of the harbour, was set aside as a so-called "coloured" area. In terms of

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3. Informal settlements are formed when disenfranchised communities settle on public or private land for the purposes of constructing temporary shelters, using unconventional building materials such as zinc, plastic and hardboard.

FIGURE 1: LOCATION OF  
INFORMAL SETTLEMENTS IN  
HOUT BAY - 1988-1991.



the Black Urban Areas Act of 1945, no land was allocated to "black" people living and working in the area, as to allocate them land, would be to recognise their place in the cities.

The inadequate provision of land and appropriate accommodation for the "coloured" and "black" people working in Hout Bay gave rise to the establishment of a number of informal settlements in the valley (see Figure 1). There were five distinct communities. Three of these communities, Disa River, Dawid's Kraal and Blue Valley, were well established, predominantly Afrikaans-speaking, "coloured" communities which had developed from extended family networks. These communities experienced much harassment from the police. Despite numerous attempts by authorities to relocate them to other places in the Cape Metropolitan area such as Phillipi and Khayelitsha, the "problem" persisted and the settlements continued to grow as original residents returned and new people moved into Hout Bay in search of employment.

In 1988, a further two "squatter" settlements developed on the coastal dunes behind the Hout Bay beach, Princess Bush and Sea Products (see Figure 1). These settlements were occupied mostly by "black", Xhosa-speaking people. The establishment and growth of these two informal communities, immediately adjacent to white home owners and in a prime recreation area, evoked a strong reaction from both "white" and "coloured" formal residents of Hout Bay.

In early 1990 a "white" Property Right's Association was formed, with the intention of upholding property rights in Hout Bay and evicting those illegally occupying land in the valley. Environmental degradation, increasing crime rates and depreciating land values were amongst the arguments forwarded by local residents opposed to the settlement of these communities in Hout Bay. Considerable pressure was exerted by local residents on landowners and various levels of government to prosecute the "squatters" for illegally occupying land. The Property Right's Association offered to finance the servicing of land outside of the valley for permanent settlement by the Hout Bay informal communities as an alternative way

of addressing the situation. The informal communities on the other hand, who were highly politicised and well organised, pressurised the government to identify land in Hout Bay for their occupation, and legal aid was sought to help resist pending evictions which had been served on the Princess Bush community.

Given the sensitivity of the issue at a time of socio-political change in South Africa, traditional approaches to illegal squatting, namely the forced removal of residents and the demolition of shacks, was clearly inappropriate. Public pressure and the high level of publicity accorded to the Hout Bay squatter issue, forced the Nationalist government to seek an alternative solution which would meet the demands of the informal communities for land, and be acceptable to both the property owners in Hout Bay and the broader South African society. This response was indicative of the emerging accommodationist policy being adopted in acknowledgment of the failure of removal policies. Consequently, a firm of planners and architects was appointed by the department of Local Government, Housing and works, House of Assembly, "...to identify land and undertake the planning necessary to meet the long term needs of the homeless people in Hout Bay" (MLH, 1991).

On Christmas night of 1990, a fire broke out in the Sea Products informal settlement community, burning a number of homes. In an attempt to avoid the negative consequences of pending eviction orders, and in order to improve the conditions of those families whose homes were burnt, an urgent decision was taken by the then Minister of Housing, Welfare and Works, to allocate a portion of land in Hout Bay for permanent settlement by the informal communities. This decision was based on the planners' recommendations, who regarded the Western Cape Regional Services Council's forestry site as an appropriate site for permanent settlement by the informal communities of Hout Bay (see Figure 1). A portion of this site (18 hectares) was thus allocated for the permanent occupation by the informal settlers of Hout Bay. This was a unilateral decision made without the full participation of the informal communities or the broader Hout Bay community, and was regarded by many "white" residents as an undemocratic and "bad decision". The informal communities were also dissatisfied with the decision, and on the 1st of March 1991 submitted a

memorandum to the South African Police from the Hout Bay Squatter Coordinating Committee,<sup>4</sup> protesting against the decision to resettle all communities to the Forestry site, and for not taking account of the plight of the homeless in the harbour.

All informal communities were, however, moved onto a section (8 hectares) of the allocated forestry site, as a temporary measure, whilst the planning for the permanent site proceeded. This site was named "Imizamo Yethu" by the community, meaning "through our collective struggle".

The move proved to be highly disruptive. Community structures which had existed in each of the informal settlements prior to the move, broke down in the resettlement process. An organisational vacuum was created. People's energies were focussed on rebuilding their homes and their lives; little time was directed towards establishing any kind of effective organisational structure. It was only six months after the move that an Interim Civic Association, an organisation elected by the community to serve the community, was established.

The emergence and growth of informal settlements on vacant land in "white" residential areas, as well as their demands for permanent legal tenure and the responses of landowners and authorities to the situation are not unique to Hout Bay. Similar situations have arisen throughout South Africa, a few examples being the informal settlements in Gonubie, Eastern Cape and Zevenfontein in the Transvaal.

The Hout Bay situation serves as a suitable case study for examining some of the issues to be considered, and difficulties experienced, in planning for the settlement of informal communities in established residential areas, as it displays the critical features of this new pattern of urban growth.

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4. The Hout Bay Squatter Coordinating Committee consisted of representatives of each of the squatter communities

## ACHIEVING PARTICIPATION AMONGST DISADVANTAGED COMMUNITIES - THE PROBLEM ISSUES

In this section of the paper, we explore some of the major problem areas facing professionals and decision-makers trying to initiate and sustain community participation in development projects affecting disadvantaged communities. Where appropriate, insights gained from the Hout Bay case study are used to illustrate problem issues and explore ideas for addressing these problems.

### **Lack of Representative Local Government Structures**

Perhaps the most fundamental problem facing any professional wishing to adopt a participatory approach in planning and development, is the absence of representative local government structures in South Africa. In general, the local governments have reflected and executed the central government's Apartheid policies. Even where legislative changes allowed for the establishment of elected councils, boards and committees with advisory, administrative and executive functions, to manage "black" residential areas, they were mostly perceived as corrupt, promoting the segregationist policies of the government and were thus rejected by the majority of the people. These "black" local authorities were not autonomous municipalities since their local fiscal systems remained under the control of "white" municipalities (Swilling, 1988).

The local authority for the Hout Bay area is the Western Cape Regional Services Council which takes decisions on all planning and development-related issues. However, the management and control of the Imizamo Yethu informal settlement is the responsibility of the Cape Provincial Administration (CPA). This responsibility was transferred from the Department of Local Government, Housing and Works in June 1991.

Regulations concerning the control and management of Imizamo Yethu, promulgated in terms of the Prevention of Illegal Squatting Act 52 of 1951 (Government Gazette

No. 13054, 1991), give ultimate decision-making power to the Minister or delegated authority. In terms of these regulations, the Minister or his agent may, amongst other things, appoint a manager for the area, approve the layout plan for the settlement, and where disputes arise between the manager and the community, make final decisions.

Whilst the CPA recognised the need to involve the various communities in the planning process and supported the planners efforts to do so, where decisions had financial or political implications, a veto was exercised. The fact that ultimate decision-making power rested with the CPA (which was not perceived as representative or legitimate), efforts to sustain a participatory process and implement an outcome which was broadly supported, were undermined.

### **Gaining Access to Communities**

The first task facing responsible professionals and authorities involved in the planning and development of such areas is that of gaining access to representatives of affected communities. Lack of organisational structures within the affected community renders access difficult and can severely constrain community involvement in the planning process. This characteristic is common in many disadvantaged communities, especially newly established or resettled communities.

In the case of Hout Bay, resettlement of the various communities to the forestry site had a major impact on community cohesion and structure. Previously established organisational structures which had functioned in the five communities prior to the move, no longer seemed to operate (Gawith and Sowman, 1992). In the first few months after the move, people focused on rebuilding their shacks. Attempts to set up representative organisational structures and to involve the communities in the planning of the permanent site during this period proved extremely difficult.

Representation from the informal settlement communities at public meetings in Hout Bay called to explain the issues involved in planning and developing the site (Policy

Committee Minutes 1990/91 and Planning Committee Phase I Minutes 1990/1991) was poor. This prompted the planning consultants to erect a marquis to serve as a venue for meetings in the informal settlement. This action was taken in an attempt to improve attendance at meetings and to encourage participation in the planning process. At this time, however, the Squatter Coordinating Committee, which had been set up earlier by representatives from each of the previous "squatter" communities, collapsed. The community thus lacked a representative body with a mandate to discuss the planning principles. Meetings continued to be poorly attended and many individuals used this forum to express dissatisfaction with living conditions and inadequate services in the temporary site.

It was approximately 8 months after the move to the new site that an Interim Civic Association was elected in August 1991. This process was largely facilitated by political and social development workers from outside the community and finally enabled the process of participation to commence.

Where no organisational structures exist in a community, it may be possible for consultants to mobilize the formation of such structures around an issue, especially if it relates to an activity which will affect quality of life, such as a creche, adult education or health. In these instances, a community development worker or social scientist should be included on the project team to assist with the development of viable organisational structures and the initiation of a community involvement programme. Resources and time spent on organisational development, especially in the initial stages of project planning, could facilitate a participatory approach to planning and minimize time delays which may otherwise be experienced.

### **Identifying Appropriate Methods and Techniques of Community Participation**

#### *Methods Employed in the Hout Bay Study*

Methods of community participation employed must be appropriate to both the affected community and the stage in the project cycle. Ideally, the affected

communities should be involved in determining the process of community participation. If this is not possible, due to factors described above, the consultant should present the proposed approach or community involvement programme to the community for comment. Obtaining input from the community regarding methods of communication and participation which are currently effective in their community would be useful.

Certain lessons from the Hout Bay case study are pertinent here. Once organisational structures were in place, communication occurred through a series of meetings between members of the Civic Association, the planners and managing authorities. It was the task of the Civic to provide feedback to their constituency on proposals and developments regarding the planning of the permanent site and to obtain their comments. This information was presented to the community at general meetings held in the community hall. Meetings were advertised through the distribution of pamphlets in the community and by means of a loud hailer. Meetings were most often held in the evenings. Attendance at these meetings varied but there were seldom more than 50 - 60 people present.

While the planning exercise was underway, the authors and a representative from the Civic Association undertook a series of small group discussions throughout the community. The objectives of these informal house meetings conducted in various people's homes, was to obtain an understanding of the community's perceptions of the planning process, to identify obstacles to community participation and assess the effectiveness of informal home meetings as a method of obtaining useful insights and information. In order to cover all sections of the community, it was divided in 15 zones on a map, and meetings were spontaneously organised in each zone. Our approach was to enter a particular zone, identify a suitable venue for the meeting and then ask people whether they were interested in participating in a discussion regarding the future planning and development of the site. In general, people seemed comfortable with this approach, and the house meetings were well-attended, ranging from 8 - 20 people. The process of gathering people for the meeting took on average 40 minutes, and the meetings lasted between one and two

hours. Meetings were held in certain zones, both during the day and in the evenings, to ensure that the views and concerns of those working during the day were also heard.

These informal group discussions revealed major inadequacies in the planners' and civic's efforts to inform and involve the people of Imizamo Yethu in the planning process. Firstly, many people living in the temporary settlement were unaware of the planning proposals for the permanent site. Of those who knew about the proposals, many were ill-informed and of the impression that brick houses (as are the norm in "white", middle-class South Africa) would be provided in the next phase of the development, when in fact, only site and services were being supplied. Rumours and inaccuracies regarding the proposed development abounded. When asked how people had obtained this information, many indicated they had heard through word of mouth. It was clear that many people had not attended meetings where these issues had been discussed and very few had actually seen the proposed plans.

#### *Obstacles to Community Participation*

Several reasons were given by people for the limited participation in the planning of the permanent site: people had not received pamphlets informing them of public meetings; meetings were held in the evenings when many women were busy preparing food and looking after children, others were tired, having just returned from work; some people worked night shift; others were drinking. People also expressed their dissatisfaction with the format and proceedings of general meetings. People complained that the agenda was seldom adhered to, that committee members were sometimes late or did not attend meetings themselves, and that resolutions were seldom reached. Some mentioned that they could not understand the information presented at meetings due to language differences and the use of technical jargon. Some people felt that they were not given adequate opportunity to express their views at meetings, that scheduled meetings started late and that translations were not always provided. These concerns reflect the inexperience of committee members and the unfamiliarity of meeting procedures amongst

community members. Clearly this approach, namely reportbacks at general community meetings, failed to involve people in, and inform them of, the planning process.

Feedback from the community regarding the use of house meetings as a means of disseminating and gathering information was positive. They felt that these smaller, less formal meetings, attended by people from the same neighbourhood encouraged people to ask questions and express concerns, and requested that similar meetings be held in the future.

Whilst researchers are of the opinion that those informal meetings are an effective method of communication in such communities, they are more time-consuming and resource demanding than public meetings.

#### *Factors Influencing the Participation Approach Employed.*

There are several factors which influence the participation approach employed. In determining what approach to follow, the consultant, authority or group responsible for facilitating or initiating a public participation programme should take the factors listed in Table 1 into consideration.

**TABLE 1: FACTORS INFLUENCING PARTICIPATION APPROACH EMPLOYED**

- the scale of the project;
- the location of the project in relation to affected communities;
- the number of people likely to be involved;
- the resources available for community participation (time, funds, personnel);
- level of training of personnel undertaking participation programme;
- the presence of community development or social workers in the community;
- the level of education of parties to be consulted;
- socio-economic status of affected communities;
- the level of organisation within the community;
- the representativeness of community leaders;
- the role of NGO's in the community;
- the degree of homogeneity of public involved;
- the role of women in the community;
- the confidentiality or strategic importance of the proposal, and
- history of any previous conflict or lack of consultation.

The importance of using a combination of participation methods in the public involvement process must be emphasized. Different methods would be more appropriate at different stages of the planning and decision-making process.

Whilst pamphlets and notices can be useful methods of informing people of planning developments, a review of the literature (World Bank, 1991; FEARO, 1988; Creighton et al., 1983) and practical experience also suggests that small discussion groups or workshops are probably the most appropriate and effective form of community participation in disadvantaged communities. Such techniques are particularly useful in exploring ideas and assessing people's perceptions and level of understanding regarding specific issues.

A further obstacle to community participation in environmental planning is that many of the concepts and terms used are unfamiliar and highly technical. The assumption that disadvantaged communities would be able to comment meaningfully on plans and maps presented to them needs to be reconsidered. The use of plans is

problematic as many people have limited spatial cognition. Showing videos and slides of similar proposals or simply taking representatives of the affected community to areas where similar developments have occurred, may provide the understanding required to participate more effectively. The use of physical models is also an effective means of involving communities in the planning process. The employment of appropriate methods and techniques of community participation is therefore central to the success of the participation process.

### **Communication**

The nature of South African society means that disadvantaged communities are mostly "black" or so-called "coloured" and of different linguistic groups. Communication with people in such communities, in most instances, requires translation (in the case of Hout Bay, from Xhosa and Afrikaans to English). This imposes an additional time constraint which must be accounted for in meetings and in the distribution of printed material. Notices issued by planners or authorities in only English or Afrikaans may be inadequate as not all people are able to read and understand these languages. There is also the danger that subtle meanings may be lost and misinformation and miscommunication may occur through inaccurate translations.

The potential communication problem between planners and the disadvantaged community extends beyond that of language and nomenclature. Differences in attitudes, expectations and basic philosophies may further exacerbate the gap between the two groups (Potter, 1985).

A further logistical consideration is that such communities are most often without a telephone or other means of communication. This necessitates frequent site visits and may frustrate communication as messages may be inaccurately relayed, if at all.

## Identifying and Involving Interested and Affected Parties

The identification and involvement of interested and affected parties is fundamental to most participatory planning approaches as well as environmental impact assessment procedures which inform decision-making (Ministerie van Cultuur, Recreatie en Maatschappelijk Werk, 1981; Creighton et al., 1983; FEARO, 1988; Burdge and Robertson, 1990; Fuggle et al., 1992; Fuggle and Rabie, 1992).

However, the literature dealing with community participation in developing countries, and in projects benefitting disadvantaged communities, is less clear about the nature of involvement of interested and affected parties, other than the involvement of beneficiary or target community (Paul, 1987; Moser, 1989; Yap, 1990). Procedures for involving all interested and affected parties in decision-making are particularly problematic where the beneficiary community is seen to be gaining (albeit a basic right such as serviced land) at the expense of other parties.

The resettlement of informally-housed communities on undeveloped land in established residential areas in South Africa is an example of such an issue (Sowman, 1990; Gawith and Sowman, 1992, Moltzin, 1991): It raises questions and concerns regarding which affected parties and interest groups should have access to, and be involved in, the planning and decision-making process, and what powers should be given to such interest groups (O' Regan, 1992).

In the case of Hout Bay, whilst the decision regarding allocation of land for informal settlers was imposed by the government, decisions regarding the planning and development of the permanent site are now being guided by all the people of Hout Bay. It took nearly 18 months before a mechanism was set in place to facilitate the involvement of all interested and affected parties in the process. Prior to this time, attempts at broad public involvement were characterised by conflict and polarization of different communities. This resulted in the marginalisation of the ratepaying community, who were regarded as obstructionist, and the involvement of only the beneficiary community in discussions regarding planning proposals.

However, as people in the broader Hout Bay community began to accept that the informally-housed communities were there to stay, they recognised that it was in their interests to contribute to the planning and decision-making process in a more constructive manner. A Liaison Committee, comprising five representatives each from the three main constituent groups in Hout Bay (namely the informal settlement community, the "white" ratepaying community and the so-called "coloured" Harbour community), was established. Procedures for decision-making were debated and all parties agreed that the mechanism for decision-making would be consensus of all three parties, although not necessarily of all representatives. The responsible government authorities and planners would be given observer status on the committee and invited to contribute as and when appropriate. Should the parties not reach consensus on an issue, a mediator would be appointed. Further, it was agreed that if the representatives could not agree on a mediator, or if the conflict could not be resolved through mediation, the controlling authority would have the right to make a final decision.

The Committee identified issues which would be subject to consensus decision making. These included: the extent of land to be used for the informal settlement; issues pertaining to finance and subsidies; access to the site; provision of services; social development; schooling and education, and community facilities. Issues which would be discussed but which were not subject to consensus decision-making were: the density of the development; the layout plans; construction on site; land acquisition and site allocation. Final decisions on these issues would be taken by the beneficiary community. Other issues could be added to either category if agreed to by all parties. The Committee indicated that it expected the controlling authority to implement its decisions since it had been set up as a representative decision-making body (Letter to CPA, 5 March 1992).

The establishment of the Liaison Committee has now provided a mechanism through which various interested and affected parties can contribute to the planning and decision-making process. People now have access to the process, their collective input guides what decisions are taken and there is a feeling of ownership regarding

the process. The relationship between the various groups has improved considerably and there is a genuine commitment on behalf of most of the players to reach consensus on key issues or find a compromise which is acceptable to most parties.

It is the view of the authors that the involvement of all interested and affected parties throughout the planning process, is fundamental to a participatory and democratic approach to decision-making. Affected parties have a right to be consulted so that they can identify the environmental components they value, and contribute to the formulation of socially responsible and realistic alternatives (Hill and Fuggle, 1988). Addressing this issue, particularly in relation to informal settlements in higher income areas, is a major challenge facing professionals involved in planning and development projects in disadvantaged communities. The Hout Bay Liaison Committee's structure and function, whilst not ideal, provides some ideas about how such a mechanism might be set up in such a complex situation.

### **Technical Considerations Dominate Decision-making**

In many projects in developing countries, technical and financial considerations, rather than social considerations dominate the decision-making process (Chana, 1984; Moser, 1989). Whilst rhetorical statements by governments of the importance of community participation abound, the emphasis is on the technical and financial components of the project. Certainly the viability and success of projects is determined by economic factors and not by social aspects, which include community participation objectives. This is also reflected in the budgets, power and status given to departments and staff concerned with technical aspects of a project by comparison to those dealing with social aspects, if the latter exist at all (Moser, 1989). Furthermore, since the social aspects of most development projects are considered less important than technical aspects, there may be a lack of recognition that community participation requires specialist training.

In the Hout Bay case, technical, in particular financial, considerations dominated the early stages of the decision-making process. The most crucial part of the planning exercise, the land identification process, failed to adequately address the social component. With respect to the planning and development of the permanent site, limited resources were allocated to trained personnel to handle the social aspects, including the development of organisational structures and community participation aspects of the project.

Increasingly, professionals involved in project planning and development have recognised the importance and benefits of adopting a multi-disciplinary approach (Whitaker, 1984; Zimbabwe Trust, 1990, Hill et al., 1990; Fuggle et al., 1992). The inclusion of professionals trained in the social sciences is particularly necessary in projects affecting disadvantaged communities. Where possible, an individual from within the community, with the appropriate skills, should be included on the project team to liaise with planners, and facilitate open and accurate communication between planners and the beneficiary community. If such a "skilled" individual cannot be found, it may be possible to train someone with the appropriate level of education, from within the community, to fulfill such a role. Such a multi-disciplinary approach will only succeed if technical professionals such as planners, engineers, architects and economists recognise the value of social inputs to the planning process and work with these other professionals as equal partners. Only an appreciation of each others objectives and methods will permit the exchange of ideas and enable one professional to know when to seek assistance from the other (Whitaker, 1984).

### **Time Schedules**

Effective participation in planning and decision-making is an on-going, iterative procedure which is time - consuming. This may conflict with the work and financial programme of the administrative authority who may consequently create the perception that genuine public participation leads to slower and less efficient planning (Potter, 1985). It may also be difficult to achieve where the target

community is living under desperate conditions and feels that a comprehensive public involvement programme may delay the decision-making process and the implementation of proposals. Potter (1985) notes that the immensity of some of the environmental and socio-economic problems faced by some communities has led some analysts to argue that public participation in planning is at best a luxury, and at worst, entirely unnecessary. He concludes, however, that "if a somewhat more ponderous and more costly decision results in a more workable long-term plan, then this is obviously more efficient than a quickly derived cheap solution that is in the end found to be wanting (Potter, 1985)".

To some extent the issues raised above are applicable to the Hout Bay case study. Firstly, the managing authority's financial programme determined when and how many sites could be developed in the first year of project implementation. Finance available for the first year of the project was inadequate to provide serviced sites for all people living in the temporary site. Complex issues such as who qualified for serviced sites in the first year of development, what mechanisms would be employed to allocate sites as they became available, how control would be maintained over the influx of newcomers and whether additional land should be purchased to cater for other homeless people in the valley, required careful consideration and debate. Differing views amongst the representative groups on the Liaison Committee and the need for these representatives to consult with their constituent groups, meant a lengthy negotiation process. In the meantime, the physical planning of the site proceeded in order to meet deadlines imposed by the managing authority and expectations of the target community. In many respects, the physical planning was way ahead of the participation process and most of the input received was reactive rather than proactive.

Insights from the Hout Bay case study, reinforce the importance of involving interested and affected parties at the *initial stages* of project planning, and together, working out a programme of community involvement which is acceptable to all parties. Such a programme should indicate who would participate as well as when and how such participation would occur. This process will undoubtedly require that

consultants and the government allocate more time and resources to the community involvement aspect of project planning than has previously been the case.

## CONCLUSIONS

The purpose of this paper has been to identify and address some of the difficulties facing professionals and authorities seeking to involve disadvantaged communities in project planning and decision-making. Clearly, certain problems are politically derived and their solutions are well beyond the scope of the professional team. In particular, the absence of representative and accountable local government structures, undermines the implementation of the outcome of participatory planning efforts.

However, South Africa is rapidly moving towards a participatory democracy. Thus, many of the issues raised above suggest that there is an urgent need for professionals working in this area to adopt a different attitude and approach to planning and development in disadvantaged communities. Professionals need to be made aware of the benefits of involving interested and affected parties throughout the planning and decision-making process. It is submitted that, active participation will only be achieved if affected communities are involved from the inception of plan formulation; it cannot be achieved if options have already been predetermined. Thus, mechanisms for involving all interested and affected parties must be set in place at the early stages of project planning. The Hout Bay Liaison Committee provides some ideas regarding the kind of mechanism that could be established to facilitate community involvement.

Furthermore a multi-disciplinary and participatory approach needs to be adopted in project planning and development. This would require a commitment from the professional team and authorities to allocate more time, effort and resources to the social component of projects affecting disadvantaged communities. The involvement of professionals with the necessary skills to facilitate such a participatory approach

would be essential to project success. It is suggested that the dissemination of information regarding project progress, discussions on planning and development issues, and the gathering of information and identification of concerns of the beneficiary community should be undertaken by researchers or service organisations working within the community.

In addition, the methods of public participation employed must be sensitive to issues such as the representiveness of community leaders and existing structures as well as the role of women within the community. Furthermore, methods selected must be appropriate to the organisational capacity within the community, conflicts which may exist amongst sectors of the community, levels of education and resources available in the community. In particular, it was found that information obtained from conducting informal house meetings provided insights and perceptions of the community towards the planning and development process, not readily forthcoming from public meetings and questionnaire surveys.

Finally, it must be stated that until there are non-racial, representative and accountable local government structures in place, adopting a participatory approach in projects affecting disadvantaged communities will not ensure that the wishes and decisions of the communities will be implemented.

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## PART 2

# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE AND GUIDELINE DOCUMENTS

Part 2 of this dissertation describes in detail, the proposed coastal environmental evaluation procedure (CEEP) and presents six guideline documents to facilitate its implementation. The guideline documents have been developed for use by EIA practitioners, CZM managers, decision-making authorities as well as individuals or groups involved in the various stages of the CEEP. The conceptual framework as well as the underlying principles, procedural stages and iterative processes which characterise the proposed procedure, have been largely informed by the findings and key issues emerging from the papers presented in Part 1.

In Paper 6, the characteristic features and processes of the CEEP are clearly discussed and guidance on how to initiate and sustain these processes is provided. Advice is given on when and how to employ the various tools and practical guidelines, which have been developed to undertake the tasks of the evaluation procedure. Preliminary proposals regarding appropriate institutional mechanisms for implementing the procedure are made.

Part 2 thus provides an overall package for undertaking coastal environmental evaluations in developing countries such as South Africa.

## PAPER 6

# ENVIRONMENTAL EVALUATION PROCEDURE FOR COASTAL TOWNSHIP AND RESORT DEVELOPMENT PROPOSALS\*

### INTRODUCTION

Demand for property for residential, resort and recreational development in South Africa's coastal zone is increasing annually (Van Zyl 1991; Sowman 1991). High population growth rates amongst the poor as well as improved economic standards and increased mobility amongst the more affluent sectors of the population have been largely responsible for the development and recreational pressure on prime coastal land (Sowman and Morant 1989; Sowman 1990; Henderson 1992; Kapp Prestedge and Retief 1992). However, more recently, changing socio-demographic and political conditions, in particular the removal of restrictive legislation such as the Group Areas Act 36 of 1966, and the Reservation of Separate Amenities Act 49 of 1953, have contributed to an influx of people to the coast (Coetzee and Geldenhuys 1989; Kohler 1991; Sowman 1991; Kapp Prestedge and Retief 1992). Improved international relations and the lifting of economic sanctions will also intensify pressure for tourism-related developments. Given the splendour of South Africa's coastline and the diversity of opportunities afforded by its sheltered and productive estuaries and bays, it is inevitable that increasing numbers of domestic and foreign tourists will be attracted to the coastal zone. Despite political violence and high crime rates, foreign visitation figures indicate that this is already occurring (Heath SATOUR 1993, pers comm).

Developers and authorities have encouraged and satisfied these demands and until recently there has been very little overall forward planning or control of development activities in the coastal zone (Retief and Bosman 1984; Sowman and Morant 1989; Sowman 1990; Council for the Environment 1991). Inevitably this ad-hoc and

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\* An edited version of this paper has been submitted to the journal of **Ocean and Shoreline Management**

unrestrained approach to planning and development has led to the deterioration of the South African coastline and the loss or impairment of natural attributes which attracted development in the first instance (Heydorn and Tinley 1980; Begg 1984; Siegfried 1985; Sowman 1988; Council for the Environment 1991; Sowman 1991; Kapp Prestedge and Retief 1992; Heydorn et al. 1992).

Whilst considerable progress has been made in the area of coastal zone management (CZM) in South Africa (Coetzee and Geldenhuys 1989; Retief et al. 1991; Heydorn et al. 1992; Sowman 1993) the use of environmental impact assessment (EIA) as a management strategy to achieve the goals of CZM is limited. This has been largely due to the absence of integrated coastal policies and legislative provisions that require environmental evaluations to be undertaken for activities affecting the coastal environment. However, as recently as June 1992, the Department of Environment Affairs (DEA) published a document outlining a generic procedure for integrating environmental considerations into the planning, assessment and decision-making process. A series of guideline documents was also prepared to assist with the implementation of the procedure (DEA 1992).

This evaluation procedure, termed Integrated Environmental Management (IEM) provides an overall framework within which the environmental consequences of policies, programmes, plans and projects may be identified, assessed and communicated to decision-makers (DEA 1992; Sowman et al. in press). The development of more detailed evaluation procedures, practical guidelines and tools for specific activities (such as roads and resorts) or in particular environments (such as the coastal zone and wetlands) within the overall IEM framework, is now considered to be desirable and practicable (Fuggle et al. 1992). However, for an environmental evaluation procedure to be of practical value in a developing country such as South Africa, it would need to be appropriate to the social, economic and institutional conditions of the country and implementable in terms of available expertise, resources and capacity.

In response to these needs, a formal, holistic and systematic environmental evaluation procedure, consistent with the overall principles and procedures of IEM, has been developed for coastal development proposals. The purpose of this paper

is to describe the main features of the coastal environmental evaluation procedure (CEEP) and the processes for accomplishing its tasks, as well as provide practical guidance on its implementation.

Firstly, the approach used to develop the procedure and the key issues that emerged from the reviews and investigations undertaken are outlined. The requirements of a CEEP appropriate to the South African situation, are listed. Then follows a step-by step account of the procedural stages of the CEEP. The ongoing dynamic processes which characterise the procedure, such as scoping and public participation are clarified and information is given on how to initiate and sustain these processes. Guidance is given on how various tools and methods such as questionnaire checklists and technical advice notes, developed to assist with the tasks of this evaluation procedure, can be employed to implement the procedure.

The CEEP described in this paper has been developed specifically for handling coastal township, resort and recreational development applications, since these proposals constitute the major development pressure in the coastal zone. However, the procedure would be applicable to all proposals including policies, programmes, plans and projects affecting the coastal zone although certain aspects such as the criteria used to classify and review projects, may have to be modified to suit the type of proposal under consideration.

## APPROACH USED TO DEVELOP THE PROCEDURE

In order to develop a procedure that was theoretically sound, acceptable to planning and decision-making authorities, coastal communities and user groups, practical to implement in terms of available expertise and resources, cost-effective, and which could be applied within the changing institutional conditions in South Africa, a review and investigation of various topics relevant to EIA and CZM were undertaken.

These included:

1. An international review of the key characteristics and global status of CZM and EIA as well as an examination of the use and effectiveness of EIA as a management strategy in CZM - type programmes (Sowman in prep.).
2. An assessment of the status of coastal zone management in South Africa and identification of action required to further the goals of CZM (Sowman 1993).
3. A review of the evolution of environmental evaluation procedures in South Africa as well as an assessment of the current status of EIA in South Africa (Sowman et al. in press).
4. A review of the various procedural frameworks proposed or employed to assess the environmental effects of developments affecting the coastal zone and an analysis of key procedural and methodological weaknesses inherent in most EIA systems (Sowman in prep.).
5. An investigation of ways of broadening the scope and improving the practice of public participation especially amongst disadvantaged communities, throughout the planning, environmental assessment and decision-making process. This was achieved by drawing on the literature, practical experience and case study material. Particular attention was given to developing the public participation aspect of EIA since this was identified as a major area of weakness in most EIA systems especially those applied in developing countries, and is of particular importance given South Africa's move towards a participatory democracy (Sowman in press; Sowman and Gawith in press).
6. A review and assessment of available methods and tools employed to assist with the tasks of EIA. This led to the identification and where appropriate, modification and development of simple cost-effective methods, such as a group evaluation method for assigning significance, and tools, such as technical advice notes, criteria and questionnaires for undertaking specific tasks of impact assessment (see Guideline Documents 1 - 6).

In particular, the use of the concept of recreational carrying capacity to assist with assessment and review of proposals leading to increased recreational pressure in coastal environments, was investigated (Sowman 1987). This led to the development of procedural guidelines for assessing recreational carrying capacity in coastal areas where development had already occurred.

Throughout the development of the procedure and practical guidelines, discussions were held with developers, planners, environmental professionals, non-governmental environmental organisations, as well as those involved in research and management of the coastal zone, in order to obtain their input regarding the adequacy and practical implementation of the proposed procedure.

## KEY ISSUES EMERGING FROM THE REVIEWS AND INVESTIGATIONS

The conclusions and key findings emanating from the reviews, analyses and case studies undertaken, are presented in detail in the papers referenced above. Thus only a summary of the key issues that informed the development of the CEEP is given here.

1. The international review of the use and effectiveness of EIA, as a strategy for furthering the aims of CZM, revealed several problem areas which contribute to its poor performance, especially in developing countries (Sowman in prep.). Of particular relevance to this study were the procedural and methodological weaknesses which limit the effectiveness of EIA.

In summary, the areas of weakness in the EIA procedures employed in developing countries include: inadequate consideration of alternatives; insufficient attention given to consideration of positive impacts; constraints imposed on the study due to unclear terms of reference; lack of public participation at various stages of the EIA process (including the scoping, evaluation, review and appeal stages); limited monitoring; the use of inappropriate EIA methodologies; inadequate methods of impact prediction,

make uncertainties and decision criteria explicit, and limited practical guidance for undertaking the tasks of EIA (Lee 1982; Hollick 1986; Ahmad and Sammy 1987; Biswas and Geping 1987; Wathern 1988; Stauth 1989; Brown 1990; Thompson 1990; Yap 1990; Fuggle and Rabie 1992; Sorensen and West 1992).

In particular, the worldwide call for increased public participation in all aspects of planning, environmental assessment and decision-making as well as CZM programme formulation and implementation needs to be addressed (Hudspeth 1982; Potter 1985; Canter et al. 1988; FEARO 1988; Johnson 1989; Olsen 1991; World Bank 1991). This is particularly pertinent in the South African context, given a history of non-participation and the current moves towards a participatory democracy. The importance of addressing this inadequacy and making public participation operational in all aspects of planning, assessment and decision-making was a key consideration in the development of the CEEP (Sowman in press, Sowman and Gawith in press). In particular, the active involvement of disadvantaged communities throughout the environmental planning and assessment process and the identification of appropriate methods for their participation, must be addressed.

2. Other factors which contribute to EIA's poor performance in many developing countries include: style of government; inadequacies in the institutional arrangements for implementing EIA; limited resources, expertise and data. In developing the CEEP, it was important to take account of these factors in order to develop procedures that were appropriate to the changing political, socio-economic and institutional conditions in South Africa and implementable in terms of available resources, expertise and data.
3. To date, the focus of EIA has been on the production of a report - the environmental impact statement - to inform decision-making rather than on the processes involved in generating information and undertaking the evaluation (McCool 1988; Sorensen and West 1992). If EIA is to achieve its objectives, these processes must be clarified and greater emphasis must be given to

identifying and implementing appropriate processes necessary to achieve an acceptable product.

4. The practice of undertaking EIA as a separate activity rather than as an integral part of the planning process is considered to be another major area of weakness (Whitaker 1984; Lim 1985; Wood 1988; Brown 1990; McDonald and Brown 1990; Armour 1990; Fuggle 1990;). The integration of environmental considerations and community concerns in the planning and development of coastal proposals must be urgently encouraged.
5. Furthermore, conducting project-specific EIA's in the absence of broader policies, programmes and plans, which have themselves been developed and assessed in accordance with the principles of EIA, the so-called "tiered" EIA system (Lee 1982; Westman 1985; Wood 1988) limits the effectiveness of EIA as an instrument of environmental or coastal policy. The advantages of undertaking EIA within a "tiered" system suggests that it is a highly desirable approach to EIA and should be afforded considerable attention.

Whilst the recently developed IEM procedure (DEA 1992; Sowman et al. in press) applies to all activities which may significantly affect the environment, South Africa's slow start in implementing formal environmental evaluations means that existing policies, programmes and plans have not been shaped and informed by environmental considerations. Whilst the development of a "tiered" approach to evaluating proposals affecting the coastal zone is highly desirable, it will be some considerable time before a coastal policy, programme and plan are in place which have been formulated and assessed in terms of the requirements of IEM. Figure 1 shows a proposed "tiered" system for the evaluation of proposals affecting or located in the coastal zone. In the meantime, there is an urgent need to develop detailed procedures for evaluating development proposals which are negatively impacting on the coastal zone.

TIER OR LEVEL OF ASSESSMENT

EXAMPLES

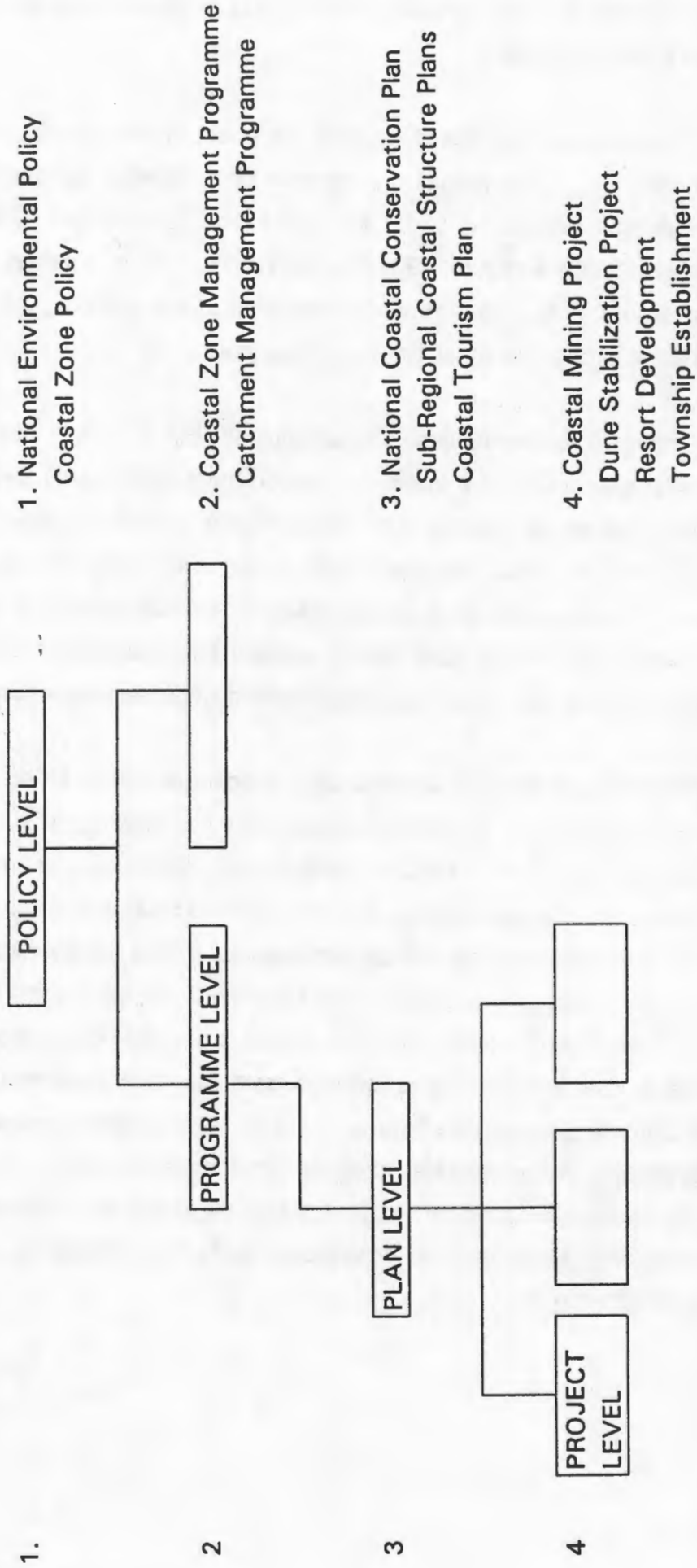


Figure 1. Tiered EIA system for South Africa's Coastal Zone (Adapted from Westman, 1985)

6. A review of CZM efforts in South Africa revealed that whilst various strategies are being employed to promote the sustainable use of coastal resources, there are several inadequacies within existing efforts. These include the absence of a clear CZM policy to guide efforts, lack of coordination amongst government departments involved in CZM, as well as inadequacies with the legal and administrative system governing CZM. An assessment of the application of EIA as an instrument of coastal management revealed that at present there are no legislative or administrative requirements that activities resulting in significant impacts on coastal environments be subjected to formal environmental evaluations (Rabie 1990; Fuggle and Rabie 1992; Sowman 1993; Sowman et al. in press). This reinforced the need to develop appropriate procedures for evaluating the environmental implications of development applications in the coastal zone (Sowman 1993).

The review revealed that EIA's are being undertaken on an ad-hoc basis and only a few preparers of EIA's are applying the principles and procedures of EIA or the newly developed generic IEM procedure (Fuggle and Rabie 1992; Heydenrych, Cape Provincial Administration 1993, pers comm). Whilst EIA's are not mandatory in South Africa, provision exists in the Environment Conservation Act 73 of 1989, which require that EIA's may be required for specific activities, or proposals located in designated environments, usually environmentally sensitive or important areas such as the coastal zone. The promulgation of regulations in terms of this Act would require environmental evaluations to be undertaken for specific proposals.

The finding that township expansion and the development of resorts and related recreation facilities are largely responsible for the degradation of the coastal environment suggested that immediate attention must be given to developing EIA-type procedures for such activities.

7. The practice of applying sophisticated methods and tools of EIA to project appraisal in developing countries is often inappropriate and undermines the value and effectiveness of EIA. There is thus an urgent need to identify and develop simple and cost-effective methods and tools to assist with the tasks

of impact assessment appropriate to conditions in developing countries (Ahmad and Sammy 1987; Biswas and Geping 1987).

For example, the utility and application of the concept of recreational carrying capacity to assist with evaluating coastal development applications was examined. This examination revealed that there are several problems associated with applying the concept to determine optimum use levels for an area (Sowman 1987; Glavovic 1988; Henderson 1992). However, employing this concept in situations where additional development is being proposed in already developed coastal townships and resorts can provide a yardstick against which to assess whether the human pressure generated by the additional development can 1) be safely accommodated by the area in terms of the spatial requirements of the activities pursued; 2) be sustained by the environmental resources of the area; and 3) will not adversely affect the quality of the recreation experience being sought (Sowman, 1987). This general assessment must however, also be guided by other factors such as regional planning proposals and management objectives for the area.

## REQUIREMENTS OF THE PROCEDURE

On the basis of key issues that emerged from the reviews undertaken, and discussions held with relevant government agencies, professionals and interest groups, broad requirements for the CEEP emerged.

1. The procedure had to be consistent with the principles and procedures of IEM, a generic framework for evaluating proposals likely to result in significant impacts on the environment. It should consist of a formal, systematic approach, which would result in the identification, analysis, evaluation and effective communication of all significant impacts of reasonable alternatives associated with a coastal proposal. Whilst the IEM procedure provides a framework for undertaking the evaluation, greater clarity is needed on the processes which characterise the procedure, how they could be initiated and sustained. This requires the involvement of affected parties, relevant authorities and the

consultants in identifying appropriate and acceptable processes for undertaking the tasks of planning, assessment and decision-making. The outcome of the processes should result in the identification of those key, critical and/or significant impacts, both positive and negative, so that trade-offs amongst alternatives can be made and the alternative which results in the least impact and the greatest improvement of social well-being can be selected. It is imperative that incomplete information and uncertainties be made known, and that decision criteria be made explicit.

2. The procedure should ensure a holistic and multi-disciplinary approach to the evaluation of the environmental consequences of a development application. It followed that evaluation should be based not only on the grounds of technical and economic feasibility but also on an evaluation of the impacts of the proposed development on the bio-physical, socio-economic, aesthetic, historical and cultural environment. The involvement of relevant specialists in the evaluation process and the adoption of a systems perspective in addressing the problem should be encouraged.
3. The identification and consideration of environmental and community concerns should commence at the initial stages of project planning and continue throughout the planning, assessment, detailed design and decision-making process, and where appropriate should include the monitoring and decommissioning phases of projects.
4. The procedure must ensure the reasonable considerations of alternatives and an on-going and iterative process of investigation and evaluation. This would reduce the number of alternatives so that only realistic and favoured alternatives are considered in the final stages of evaluation.
5. The procedure must identify ways of involving the public throughout the planning and evaluation process. In particular, methods for involving disadvantaged communities in the EIA process must be examined and tested.

6. Appropriate methods must be identified, and where necessary modified, and tools and guidelines must be developed, to assist with undertaking the tasks of the CEEP.
7. In order for EIA to contribute to furthering the policies and goals of CZM, it is essential that the policies guiding a country's CZM efforts be clearly stated. In the absence of broadly acceptable policies for South Africa's coastal zone which embrace bio-physical, socio-economic, cultural and aesthetic aspects (Kapp Prestedge and Retief 1992; Sowman 1993), it is necessary to identify goals for CZM in South Africa which would guide the assessment of coastal development applications.
8. The proposed procedure should incorporate management strategies that exist as well as make use of the various documents and guidelines that have recently been developed for coastal zone management in South Africa. The procedure should indicate at what stage, and how, the various inputs could be applied.
9. Implementation of the procedure should deliver reasonable results, at reasonable costs, and within a reasonable time period. It should operate effectively given the expertise, resources and data available in the country.
10. Finally, it should be methodically sound, broadly acceptable and sufficiently flexible to adapt to a variety of institutional arrangements.

Figure 2 provides a diagrammatic representation of the IEM procedure, indicating those aspects which have been developed in detail for the evaluation procedure for coastal township and resort development proposals in South Africa. Figure 3 outlines the proposed CEEP. This procedure should not be regarded as an inflexible sequence of stages that has to be followed rigidly; rather it attempts to provide clear guidance on the tasks that must be undertaken when evaluating coastal applications and the processes which must be initiated and followed in order to reach a decision which is broadly acceptable.

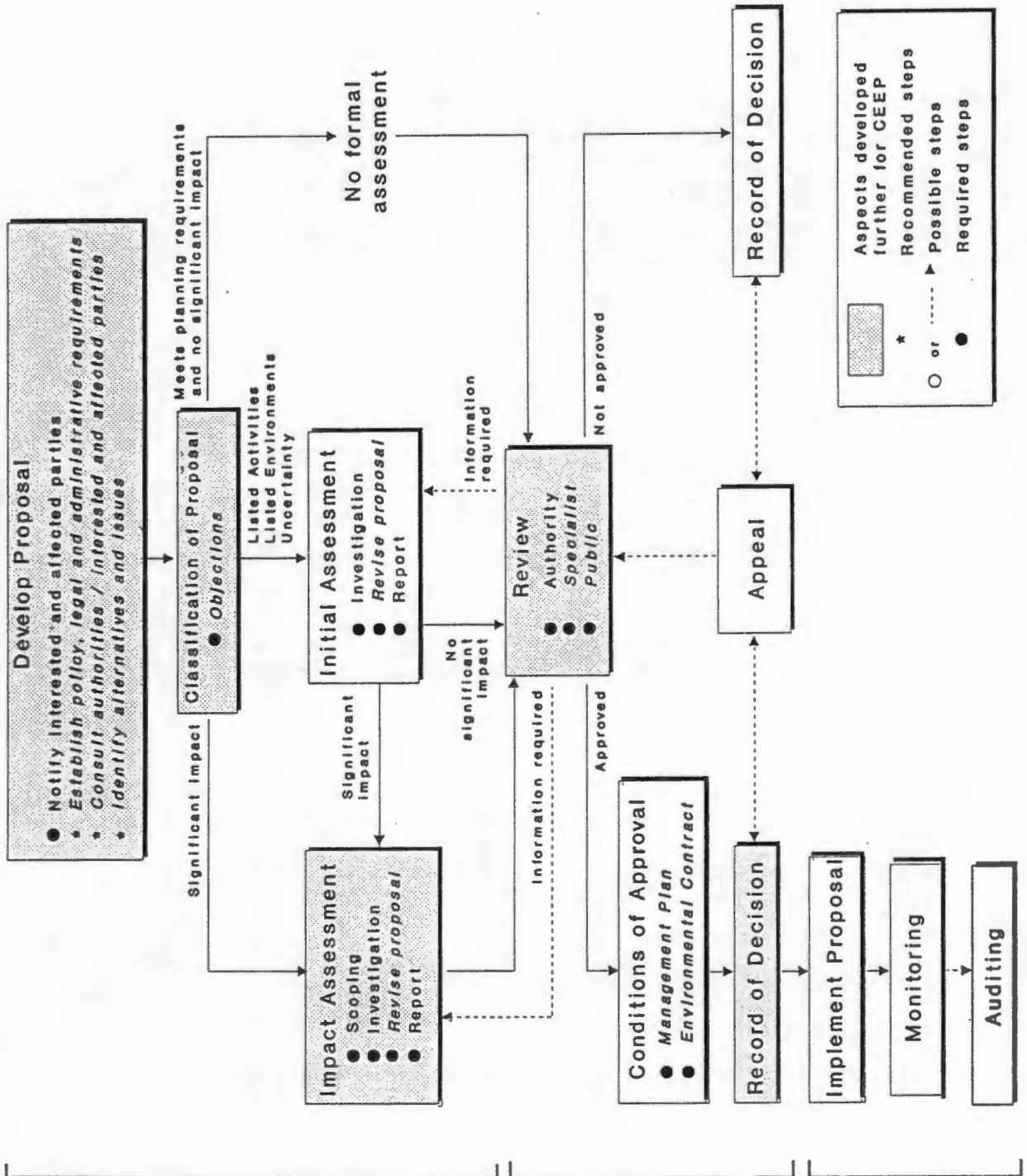


Figure 2. Integrated Environmental Management Procedure

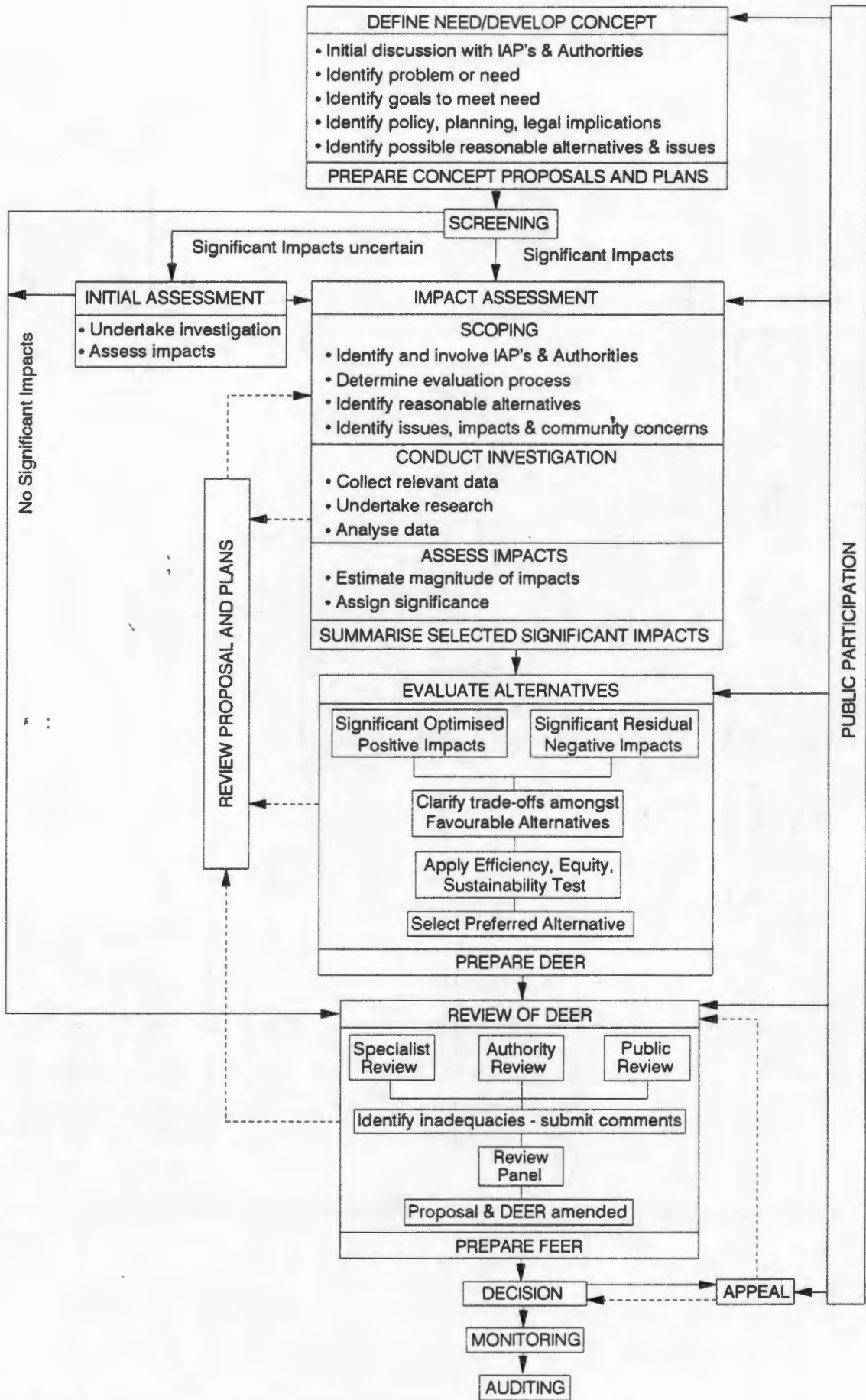


Figure 3 Coastal Environmental Evaluation Procedure (CEEP)

## THE PROPOSED COASTAL ENVIRONMENTAL EVALUATION PROCEDURE (CEEP)

### Defining the Need and Developing the Concept

One of the key principles underpinning IEM is that environmental considerations and community concerns should direct the planning and development of proposals, rather than being considerations to be addressed once the proposal has been planned (DEA 1992). Thus at the outset of any planning exercise, prior to the drafting of even preliminary proposals, it is recommended that the proponent (or his/her consultant, hereafter the proponent) routinely undertake the tasks identified on the list below:

- Notify adjacent landowners, key interest groups and responsible authorities of an intention to undertake a development activity;
- Hold discussions with these parties, preferably after all parties have visited the site, regarding preliminary ideas for the development of the site;
- Identify the problem that needs to be addressed (e.g. restoration of storm damaged recreational facilities) or establish the need<sup>1</sup> for the proposed development (e.g. pressure for holiday accommodation in the area);
- Identify preliminary goals to meet needs;
- Consider likely compliance of development proposal with existing policies (e.g. documents on Coastal Zone Management, Council for the Environment 1989

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1. In terms of legislation applicable to development proposals in the Cape coastal zone there is no requirement that need for the project be established, only its desirability (Cape Land Use Planning Ordinance 15 of 1985). This thinking is contrary to the principles underpinning most environmental and coastal zone management policies (see Table 1). Thus establishing need is considered a fundamental requirement of the evaluation procedure.

and 1991), goals for CZM (Table 2) as well as any relevant plans such as sub-regional coastal structure plans (Cape Provincial Administration 1990);

- Identify reasonable and practicable alternatives to proposal;
- Identify and consider issues, opportunities and constraints associated with reasonable alternatives;
- Consider infrastructural requirements of the proposal, particularly financial arrangements with regard to the provision and maintenance of services;
- Where possible identify mitigatory measures for reducing possible impacts resulting from suggested alternatives.

This list of tasks is by no means exhaustive. It is anticipated that additional issues will be raised for different project proposals, which may necessitate undertaking additional tasks. This is inevitable since every environmental setting is unique, as is each project proposal.

By involving the authorities other interested and affected parties (I&AP's) in the tasks described above, and by addressing these issues and concerns in the further planning and development of the project, the planning stage will be more streamlined, and the assessment and decision-making processes expedited. Failure to address concerns and consider alternative proposals suggested at this stage, may result in significant delays and additional costs to developers.

On the basis of information generated at this initial stage, the proponent should prepare a preliminary concept proposal and plan (which may include one or several alternative approaches to meeting the stated purpose of the project) for the next stage of the CEEP - the screening stage.

## Screening

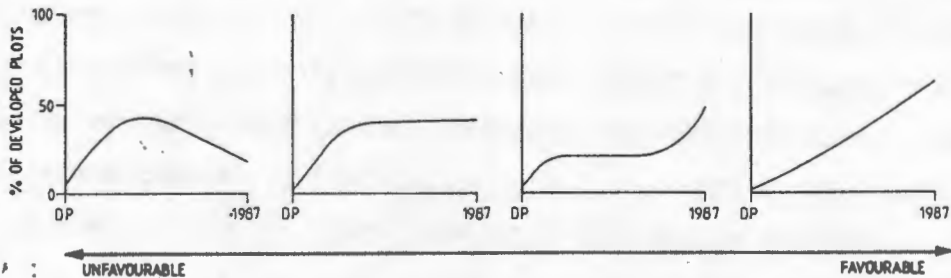
The purpose of screening is to determine at this early stage whether a proposal should be subjected to a full environmental evaluation, an initial evaluation or no formal evaluation (Figure 3). The key to determining whether a proposal requires a full evaluation or not is if its implementation will result in significant impacts.

In terms of the IEM requirements, if no significant impacts are identified during the initial planning stages, coastal township and resort development proposals would only require that an initial evaluation be undertaken. (This is the case, since township development and associated proposals such as rezonings and the subdivision of land are included in a List of Activities, and the coastal zone and its component parts, is included in the List of Environments (see Appendix 1 for these Lists)). The List of Activities indicates activities which, based on past experience, are likely to result in significant impacts. The List of Environments indicates particularly sensitive and ecologically important areas. Should a proposal be included in the List of Activities or List of Environments, it is likely that significant impacts will result but if this has not been ascertained during the preliminary planning stages then the proponent is required to undertake only an initial evaluation. However, it is anticipated that most coastal township and resort developments will result in significant impacts and a full environmental evaluation will be necessary.

In order to further assist with the classification of coastal proposals, a list of screening criteria has been developed (Table 1). These criteria include the goals of CZM in South Africa (Table 2) developed specifically for the CEEP. If a proposal does not comply with any of these criteria, it is assumed that a significant negative impact will result and a full scale environmental evaluation would be required. However, some discretion is required here, since the implementation of mitigatory measures may result in avoiding impacts. For example, a proposal which will restrict public access to the coast (refer Goals of CZM - Table 2), would certainly result in a significant impact. However, the development of an alternative access route, via a subway or foot bridge may address the problem. If this issue constitutes the only impact of the proposal, only an initial evaluation would be required.

**TABLE 1: SCREENING CRITERIA**

1. A moratorium on new developments in undeveloped and undisturbed coastal areas i.e. development should be concentrated at existing development nodes;
2. Location of development in relation to the categories of the Coastal Sensitivity Classification Scheme<sup>2</sup>;
3. Compatibility of the proposal in relation to regional, sub-regional and local coastal structure plans;
4. Compliance of the proposal with the goals of CZM in South Africa (Table 2);
5. The current level of development in the existing or adjacent township/area. This is of particular importance where the application is for township extension. Where the number of developed plots in the existing township is less than 50%, township extension for the purposes of providing additional residential plots should be discouraged;
6. The rate of development in the existing or adjacent area. This should also be considered since certain factors (e.g. the construction of a major facility in the vicinity of the coastal township) may result in a sudden increase in the number of developed plots, even where existing development is less than 50%. The graphs below provide a scale against which to assess whether the rate of development in a coastal town indicates that further development is desirable or not (criteria 5 and 6 need to be considered jointly).



Graphs used to assess whether or not the rate of development in a coastal town indicates that further development is desirable (DP = date of township proclamation).

## The Initial Environmental Assessment

An initial evaluation is usually undertaken when (1) a proposal is included in the List of Activities or in the List of Environments, (see Appendix 1), but no significant impacts have been identified during the initial planning stages, (2) proposals comply

2. The Coastal Sensitivity Classification Scheme comprises a series of 1:10 000 orthomaps in which the coastal zone, defined as a strip of land 1000m wide landward of the HWM, is classified into three categories on the basis of physical and ecological sensitivity for development. These are as follows: Stable areas, where development could take place with relatively little risk, if sound ecological and planning guidelines are adhered to. Intermediate or moderately sensitive areas, where further investigations must be carried out to determine whether development is feasible or desirable. Highly sensitive areas, where no development should be considered.

with the screening criteria (Table 1) and support the goals of CZM (Table 2) but uncertainty still exists as to whether significant impacts will result or not, and (3) where impacts have been identified but it is envisaged that the application of mitigatory measures will significantly reduce or avoid impacts.

**TABLE 2: GOALS FOR CZM IN SOUTH AFRICA<sup>3</sup>**

<ul style="list-style-type: none"> <li>- Recognise and manage the coastal zone - coastal waters and adjacent lands - as a functional unit;</li> <li>- Plan, use, develop and protect the coast in the public interest;</li> <li>- The natural systems and processes in the coastal environment which serve essential ecological and human functions should be safe guarded, and where necessary and possible, rehabilitated;</li> <li>- The coastal landscape including features of geological, geomorphological, archaeological, historical, cultural and aesthetic importance shall be protected and where appropriate restored;</li> <li>- Development and human activities should take place on a sustainable basis as far as is practicable;</li> <li>- Development should be directed towards environmentally (used in its broadest sense) appropriate locations and discouraged in environmentally important areas; (e g sites of cultural significance) ecologically sensitive areas (e g primary dunes); and vulnerable areas (e g areas susceptible to sea-level rise);</li> <li>- Environmental issues and community concerns and values shall be incorporated into the planning, development and management of the coastal zone;</li> <li>- Management of coastal resources and areas shall be undertaken in such a way as to provide for the social, economic and cultural well being of all people, and for their health and safety;</li> <li>- The maintenance and enhancement of public access to the coast shall be ensured;</li> <li>- Living coastal and marine resources shall be used and harvested on a sustainable basis;</li> <li>- Non-renewable resources shall be used efficiently, the benefits of their exploitation distributed equitably, and the methods of exploitation and use should not degrade the coastal environment;</li> <li>- The ecological, economic, cultural, spiritual, amenity and intrinsic values of the coastal zone shall be used, developed and protected in such a manner as to cater for the reasonable needs of future generations;</li> <li>- Coastal authorities, communities and user groups shall be informed, empowered and thus enabled to participate in the management of their coastal resources and areas;</li> <li>- Where the government is party to international agreements and obligations which affect the coastal environment, domestic actions shall comply with the requirements of such agreements.</li> </ul>
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3. These goals have been formulated from a review of (1) policy statements of various CZM-type programmes worldwide, (2) the principles and objectives of CZM management in South Africa, as outlined in a document prepared by the Council for the Environment (1989) and (3) the proposed goals and objectives of CZM identified by a multidisciplinary group of experts concerned with initiating a process to formulate a CZM policy for South Africa (Kapp Prestedge and Retief 1992).

In the case of (1) and (2) the proponent should be required to obtain just enough information to determine whether the proposal will result in significant impacts or not. This may involve appointing a consultant to undertake a preliminary investigation of the issue of concern, such as ground water pollution, or simply holding discussions with the relevant government department and local communities. Investigations and discussions should focus only on those areas of uncertainty. If significant impacts are identified then a full environmental evaluation should be undertaken. The information gathered during this initial evaluation will provide useful background to the scoping process which is central to the evaluation procedure.

**TABLE 3: SUMMARY LIST OF COASTAL ENVIRONMENTAL CHARACTERISTICS**

Could the proposed development have a significant impact on, or be constrained by, any of the following?	
1.	Physical characteristics such as the geology and soils of the site and its surroundings?
2.	Marine and/or estuarine characteristics, features and dynamics?
3.	Water resources, including ground water resources, surface water features, water quality considerations?
4.	Ecological characteristics of the site and surroundings?
5.	Nature and level of present and future environmental pollution in the area?
6.	Existing and proposed land-use activities in the area?
7.	Socio-demographic characteristics of the area and affected parties?
8.	Local and regional economy including employment characteristics?
9.	Community cohesion, values and lifestyles of people living in the vicinity of the development site?
10.	Recreational patterns of use and recreational facilities?
11.	Transport networks and parking facilities?
12.	Cultural and historic resources and sites?
13.	Landscape character and quality?
14.	Existing and proposed infrastructural services?
15.	Health, safety and risk considerations?
16.	Cumulative and synergistic effects?

To assist in the identification of impacts, the proponent is referred first to a general list - A Summary List of Coastal Environmental Characteristics (Table 3) and if uncertainty still exists and further questioning on a particular topic is required, the reader is referred to a more comprehensive list of questions - A Briefing Questionnaire (see Guideline Document 1). (The purpose and contents of this Briefing Questionnaire are discussed in detail in the following section of this paper).

If no significant impacts are identified, the proponent must submit a short report based on the 16 questions posed in the Summary List of Coastal Environmental Characteristics and where appropriate attach to it any relevant information (e.g. specialist report on water quality effects) that led to the finding of no significant impacts. This report is then submitted for review (Figure 3).

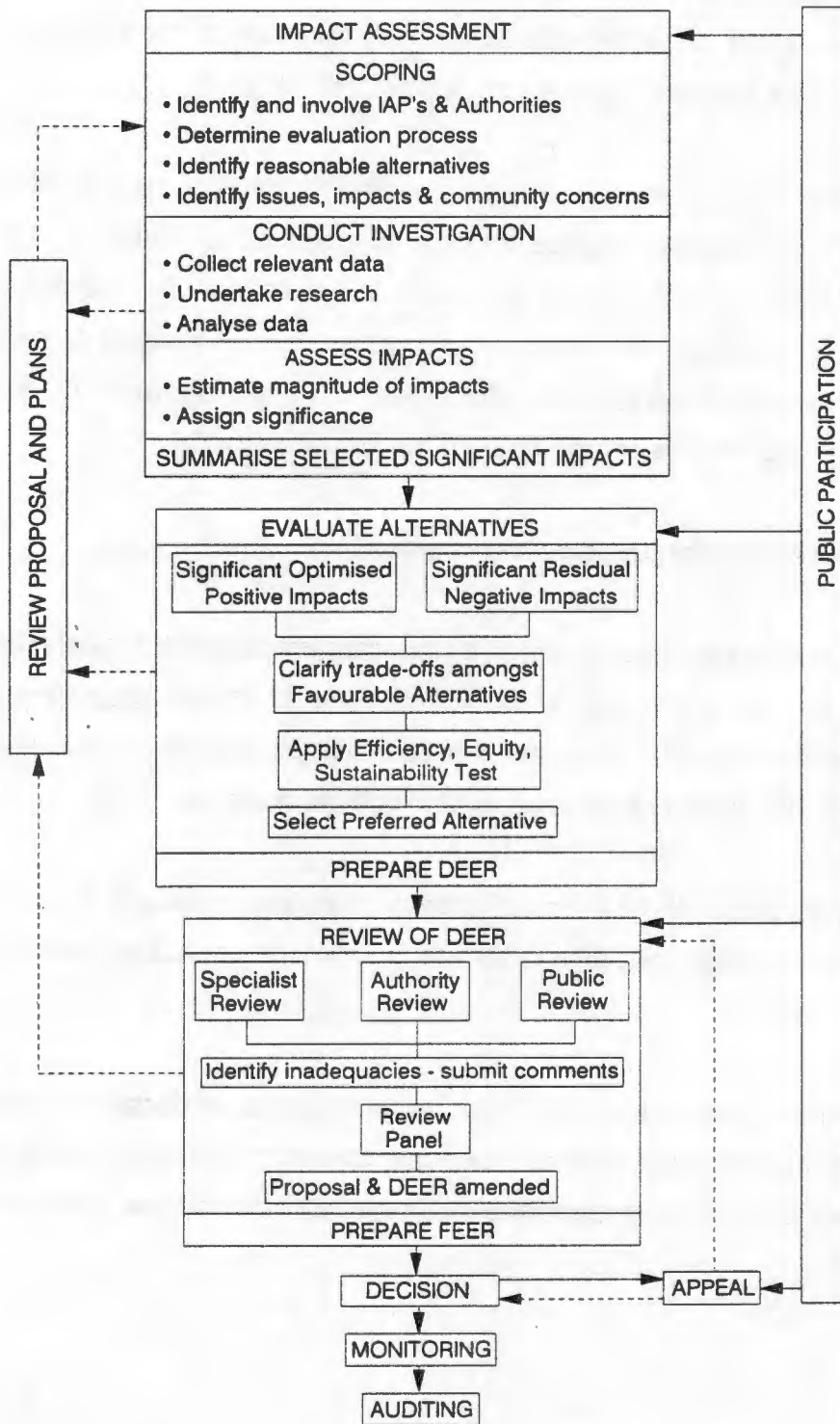
In the case of (3) above, it may be possible to identify appropriate mitigation measures which could reduce impacts to insignificant levels. The initial evaluation report, should identify significant impacts, measures for mitigating impacts, and include a management plan incorporating these mitigation measures for the implementation of the project. Adherence to the management plan would thus form part of the conditions of approval of the development.

### **The Environmental Impact Assessment**

If the screening criteria or initial assessment indicate that significant impacts will result from implementing a proposal, then a full environmental evaluation is undertaken. This is likely to be the case for all township, resort and recreational development proposals located in the coastal zone.

The key stages of the full environmental evaluation procedure for coastal township and resort development proposals are given in the figure overleaf which is an extract from Figure 3.

The final stages of the CEEP, namely those of undertaking and recording the decision, appealing against the decision and monitoring the implementation phase of the project are in accordance with the IEM procedure (refer Sowman et al. in press).



### *The Scoping Process*<sup>4</sup>

Scoping is an on-going, dynamic process concerned with determining the extent of and approach to an environmental impact assessment or evaluation and involves the following tasks:

- Identification and involvement of relevant authorities and interested and affected parties (I&AP's);
- Reaching agreement on the details of the evaluation and decision-making processes to be followed;
- Identification of the roles and responsibilities of the various players involved in the evaluation procedure;
- Identification and selection of reasonable alternatives;
- Identification of issues, impacts (both positive and negative) as well as community concerns and priorities for consideration and investigation.

The main functions of scoping are, through the involvement of authorities and I&AP's (1) to reach consensus on the details of the evaluation process and (2) to focus the evaluation thereby ensuring that only significant issues and reasonable alternatives are examined.

It must be emphasised that scoping is an on-going, transparent and iterative process and will continue throughout subsequent stages of the proposed evaluation procedure. It is inevitable that as the process unfolds, other interested parties may wish to become involved, additional issues and alternatives may be introduced and

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4. This section on Scoping has to a large extent been based upon information contained in the Guidelines for Scoping document (Department of Environment Affairs 1992) which was prepared by the author. However, the scoping process proposed for CEEP places much more emphasis on the **process** of scoping and the importance of sustaining it throughout the evaluation procedure.

others may be eliminated. These events may require some modifications to the evaluation process agreed upon during the initial scoping exercise.

It is recommended that during the initial scoping stage, a scoping committee, comprising elected representatives from major interest groups, affected parties and responsible government agencies be established. This scoping committee would be collectively accountable and responsible for guiding the evaluation process and facilitating on-going public involvement. They would not be concerned with technical and substantive matters but on guiding the environmental evaluation process.

#### Identifying and Involving Relevant Authorities and Interested and Affected Parties (I&AP's)

It is recommended that direct contact be made with all authorities which have a specific interest in the proposal, or responsibility for the area or proposed activity. The use of established lists and the process of networking are considered effective methods of identifying and obtaining the involvement of interested and affected parties.

As many of the property owners and recreation users in these coastal towns live elsewhere and are absent for a large percentage of the year, notices informing them of the proposed activity and inviting them to participate in the evaluation process should be sent to their permanent addresses. This information should be available from the local authority or local ratepayers association. The involvement of seasonal holidaymakers in the evaluation process is more complex. Ideally the initial scoping exercise should be initiated during a holiday period so that individuals representing the different views of holidaymakers can be identified and brought on board the scoping process.

Where the proposal is of regional or national significance, notifying the public of a proposal, and inviting them to participate in the process could be achieved through the press or other media. Further details on methods and techniques of notifying and involving interested and affected parties are presented in the section which provides practical guidelines for implementing CEEP (see Guideline Document 3).

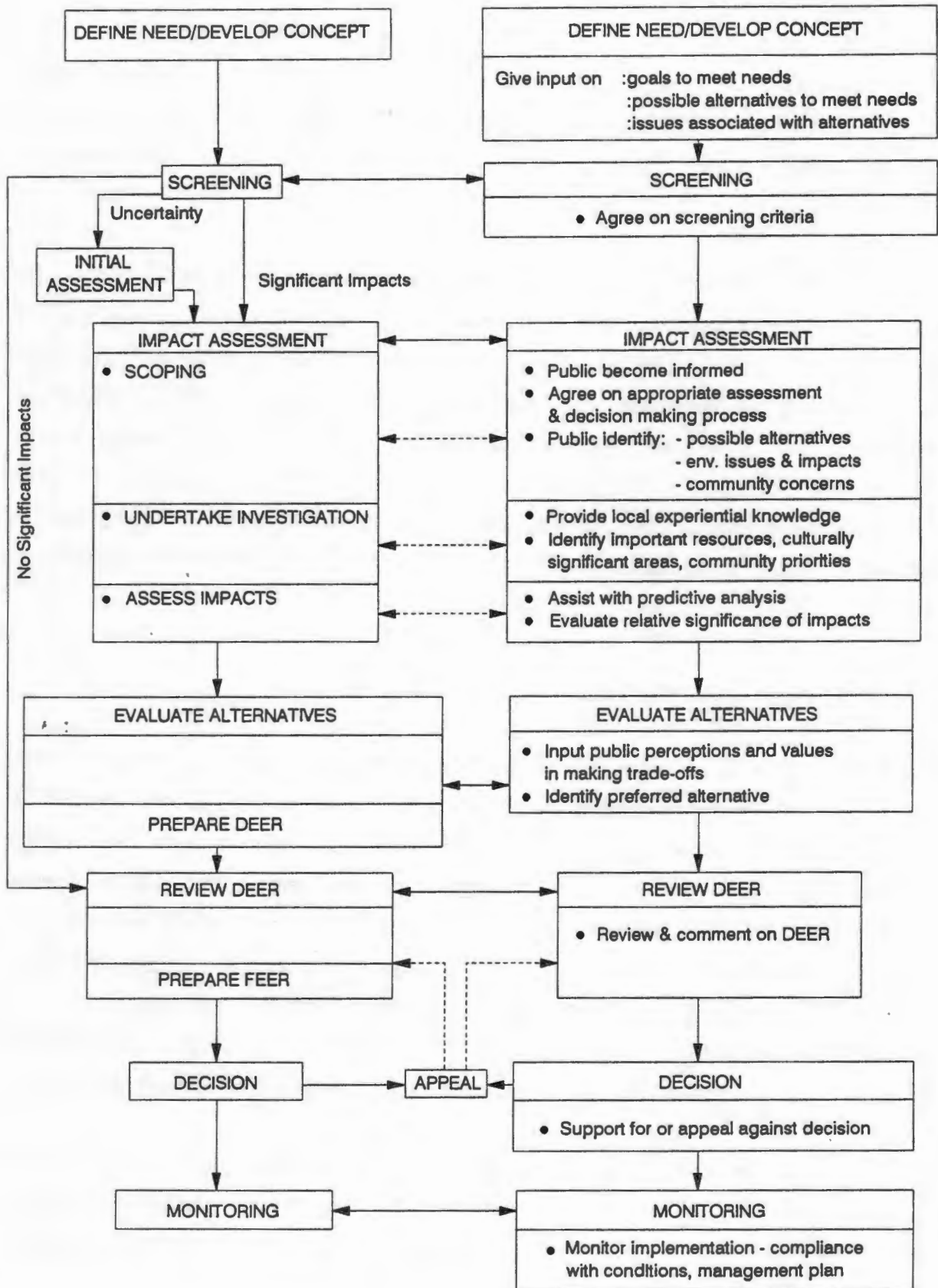


Figure 4 Public Participation In the Coastal Environmental Evaluation Procedure

The involvement of disadvantaged communities including illiterate people in the scoping process and obtaining their active participation in the public participation programme requires special consideration in the South African context (Sowman and Gawith in press). Possible ways of establishing contact with such communities and obtaining their participation in the evaluation process are presented in Guideline Document 3.

It may be possible at this point, to identify who could serve on the scoping committee. This representative group could then be responsible for undertaking the other tasks of scoping. It would be the responsibility of each scoping representative to identify appropriate procedures and methods for informing and involving their constituencies throughout the evaluation process. Proposals for making public participation operational throughout the environmental planning, assessment and decision-making process are given in Sowman (in press). An indication of the nature and tasks of public participation at the various stages of the CEEP is presented in Figure 4.

#### Reaching Agreement on the Process to be Followed

Whilst the evaluation procedure provides a step-by-step account of the key activities that must be undertaken and guidance on how they may be accomplished, it is important that key interested and affected parties and government agencies identify and agree on the process that should be followed to undertake the evaluation and reach a decision. This could include fleshing out details on aspects such as the nature of the public involvement programme, drawing up terms of reference for the evaluation, identifying expertise required for the investigations, identifying an acceptable method for assigning significance, agreeing on an appropriate review procedure and setting a realistic time frame for the evaluation process.

The processes identified and adopted will vary from project to project and will be strongly influenced by the controversiality of the project, the composition of the group charged with this task and their demands and expectations of the process.

Once an appropriate process to guide the evaluation has been determined, it is desirable that a commitment be obtained from the participants to adhere to the agreed upon process as well as the outcome of that process. Under certain circumstances, such as the identification of additional key I&AP's or the introduction of other feasible alternatives, it may become necessary to modify the process to accommodate the needs and concerns of the additional members. However, it is suggested that the scoping committee that initiates the process, anticipates such events and agrees on how they will be handled, should they arise.

It is essential that the roles and responsibilities of the various government representatives and I&AP's involved in the scoping process, be clarified at the outset of the scoping process.

#### Identification and Selection of Alternatives

Ideally the identification of reasonable alternatives should have commenced during the initial stages of defining the need and developing the concept. However, once significant impacts have been identified, the identification and consideration of alternatives becomes a requirement of CEEP.

The extent to which alternatives should be considered would depend upon (1) land ownership - whether private or public (state-owned) land, and (2) existing development rights. Proponents, both private developers and government agencies, wishing to develop public land should be required to consider feasible and reasonable alternatives including fundamentally different alternatives to meet a stated need. The following general categories of alternatives (Ministerie van Cultuur 1981, Sorensen and West 1992) provide some guidance on the types of alternatives that could be considered:

- Demand Alternatives
- Activity Alternatives
- Location Alternatives
- Process Alternatives
- Design Alternatives
- Raw Material Alternatives
- Temporal Alternatives

Proponents applying for permission to undertake a development activity in accordance with a zoning scheme, in other words where a development right exists, should only be required to consider alternatives such as design alternatives which do not infringe on his/her development rights. For certain zonings, such as amenity or resort zonings, consideration of demand and activity alternatives could also be reasonably required.

However, where a development right exists which is clearly environmentally inappropriate (such as an hotel development in a dynamic dune area), other measures such as land swaps, compensation, enhancing development rights on an alternative coastal site owned by the local or regional authority, should be investigated. Proponents applying for permission to change land-use (for example a rezoning application) should be required to consider alternative land-uses for the site, including the impacts and implications of pursuing activities in accordance with the existing zoning.

The manner in which reasonable alternatives are initially identified will depend upon the mix of notification and participation methods employed in the initial scoping stage of CEEP (see Guideline document 3). These may include informal discussions with interested parties, a questionnaire survey, or employing techniques such as brainstorming, the nominal group technique or Delphi in a workshop situation. In certain situations, such as those where expertise is lacking amongst the affected public, the appointment of a task group which includes experts and representatives of the public, may be considered the best approach for generating alternatives.

The next task is to narrow down a wide range of possible alternatives to a few feasible and reasonable alternatives which would be subject to further investigations and evaluation. Whilst various sophisticated techniques have been employed to assist with this task (Lahlou and Canter 1993) they are not considered appropriate given the resources, expertise and data available in the South Africa.

The objective here is to eliminate the non-feasible set of alternatives. The methods listed above to assist in identifying possible alternatives may once again be employed to select reasonable alternatives for further evaluation. A broad set of criteria for determining the "reasonableness" of alternatives has been developed

(Table 4). For certain proposals, it may be necessary to develop more specific criteria to assist with this initial screening of a wide range of alternatives. This is the kind of task that could be undertaken by the scoping committee.

Except for proposals on public land, it is envisaged that the majority of township and resort applications will not require the consideration of fundamentally different alternatives. However, consideration of design alternatives such as cluster versus gridiron layout for a township, process alternatives such as methods of storm water management and waste disposal and even consideration of using labour intensive approaches for construction activities would be required. Many of these ideas and considerations may emerge only during a later stage of the investigation and evaluation. It is recommended that periodic reviews of the reasonable alternatives be undertaken as information on their impacts and implications becomes available. This process of continually screening alternatives will reduce the final number of alternatives and so simplify the decision-making process.

**TABLE 4: CRITERIA FOR DETERMINING "REASONABLENESS" OF ALTERNATIVES<sup>5</sup>**

Controversiality of issues associated with alternatives Conflicts with existing policies, plans and programmes Conflicts with Regional and National interests Conflicts with International Agreements and Obligations Establishes an undesirable precedent Forecloses future options Irreversible commitment of resources Damage to important natural resources, cultural, scientific and historic sites Environmental appropriateness of technology Financial costs to Local authorities and communities
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#### Identification of Issues, Impacts as well as Community Concerns and Priorities

One of the major tasks of scoping is to identify issues and impacts, including those positive aspects of the proposal which are considered to be important by authorities and interested and affected parties. The "issues" may either be definable impacts

5. Adapted from criteria suggested in "Scoping and Guidelines" Ministerie van Cultuur, Recreatie en Maatschappelijk Werk, 1981.

(e.g. water pollution or increased employment opportunities), the cause of an impact (e.g. increased volumes of storm water runoff) or a generally expressed concern (e.g. social disruption of local fishing community), or a priority of the local population (e.g. maintenance of the undeveloped nature of the area). These issues, and concerns need to be translated into impacts and the significant ones investigated.

In order for the public and authorities to assist in identifying significant issues which require assessment, background information on the proposal, affected environment and issues and impacts already identified in the initial planning stages, should be communicated to these parties. The method and timing of communicating this information will depend on a variety of factors such as education levels of the affected parties as well as methods used during the scoping exercise.

To assist with the task of issue identification a Summary list of Coastal Environmental Characteristics (Table 3) and a detailed Briefing Questionnaire have been prepared (see Table 5 for an extract from the Briefing Questionnaire and Guideline Document 1 for the full set of questions). The Briefing Questionnaire poses a comprehensive list of questions in the categories presented in the Summary List of Coastal Environmental Characteristics regarding the nature of the development in relation to the affected environment, the impacts of the proposed development on that environment and whether the environmental characteristics and conditions pose any serious constraints to the development. Whilst use of the Briefing Questionnaire should enable the consultants, authorities and public to identify most issues requiring investigation, it must not be regarded as a comprehensive all-inclusive list, but as a guideline. It is possible that other issues will be identified.

Once a broad range of issues has been identified, the significant issues requiring investigation must be determined. There are various methods (such as the Delphi method), techniques (such as rating and ranking), criteria (e.g. Receiving Water Quality Criteria) or standards (e.g. noise regulations) which could be used to assist with this task. However, by simply asking the various affected parties to rate and rank the issues, or simply prioritize them, a clear indication of which issues are considered important and worthy of investigation would be provided. Issues

receiving a consistently low ranking should be eliminated from the study, unless there is a strong motivation to include these issues.

Where uncertainty exists, consultants should be required to initiate investigations and provide just enough information to justify why an impact was considered irrelevant or insignificant and eliminated from the study. It is likely that as the investigations proceed, other issues may emerge. This reinforces the on-going, iterative nature of the scoping process.

To facilitate the efficient and fair identification of issues, it is recommended that the scoping committee be charged with co-ordinating this activity. Committee representatives would thus be responsible for obtaining input and a final mandate from their respective constituencies regarding those issues requiring investigation.

**TABLE 5: EXTRACT FROM BRIEFING QUESTIONNAIRE**

<p><b>A</b></p> <p><b>PROPOSED PROJECT IN RELATION TO THE BIO-PHYSICAL CHARACTERISTICS OF THE SITE</b></p> <p><i>Marine and Estuarine Site Characteristics</i></p> <p>8. Will any proposed development activities result in:</p> <p>(a) Modification of dunes (e g stabilization of dunes);</p> <p>(b) Disruption of sediment movement (e g structures located in path of wind blown sand);</p> <p>(c) Disturbance of marine life (e g vehicles on the beach); or</p> <p>(d) Destruction of coastal vegetation (e g removal of Milkwood trees)</p> <p><b>D</b></p> <p><b>LANDSCAPE CHARACTER</b></p> <p>2. Please provide a brief motivation for the proposed layout, building, styles and materials used. Indicate whether and how the proposed development is architecturally compatible with existing developments and local landscape character.</p>
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### *Conducting the Investigation*

The scope and method of investigation are guided by the scoping process. Thus the collection and analysis of data should be limited to significant issues and reasonable alternatives, but should provide adequate information, so that trade-offs can be made.

In order to facilitate the systematic collection of data, the proponent is referred to the Briefing Questionnaire (see Guideline Document 1). This questionnaire is divided into three sections. Section I covers information on all aspects of the proposed development in relation to its effects on the bio-physical, socio-economic, cultural and aesthetic environment. It also requires the proponent to consider how the project may be constrained or affected by these environmental aspects. Section II requests technical and legal information regarding the proposal and site to be developed. Section III indicates what plans and information should be submitted with the project report. An example of the kind of information covered by the Briefing Questionnaire is given in Table 5.

It is likely that most significant issues identified during the scoping stage will fall within one of the categories covered by the Briefing Questionnaire. Reference to the detailed questions in the Briefing Questionnaire on the issues requiring investigation will assist in gathering data, describing baseline conditions and determining an appropriate method of analysis. Whilst a variety of methods can be employed to assist with this task, the involvement of the local people and the application of their knowledge in the collection and interpretation of data is a fundamental requirement of this evaluation procedure.

### *Assess Impacts*

#### Impact Prediction

The next task is to make predictions regarding the nature, magnitude, duration, extent, social distribution, potential to reduce or avoid impacts, as well as the range of uncertainty, cumulative and synergistic effects of the predicted changes. The predictive analysis should be guided by the following considerations:

- Likelihood of Occurrence

What is the probability of the occurrence of the predicted event?

- **Magnitude**

What are the spatial dimensions or intensity of the impact?

- **Duration (Timing)**

When, or over what time period, will the impact be experienced? Will the effect be transient, of short or temporary duration, or permanent?

- **Extent**

What is the anticipated geographical distribution or sphere of influence of the impact?

- **Irreversibility**

To what degree is the action or impact irreversible?

- **Risk**

Will any effects on the human environment involve potential risks or hazards? (These are usually impacts of low probability but high deleterious effects if they should occur).

- **Social Distribution of Impacts**

How are impacts distributed amongst different groups? Are there groups, especially minority or disadvantaged groups which will be inequitably affected by the proposed action?

- **Potential to Enhance and Mitigate Impacts**

What measures are proposed to enhance positive impacts? Can remedial measures be taken to minimize or avoid negative impacts?

- Uncertainty

What evidence exists to demonstrate the level of confidence in the predicted change? What is the range of uncertainty associated with the impact prediction?

- Cumulative and Synergistic Effects

Are there any consequences of actions which when combined with other actions and effects add up to a significant total impact? Could there be interactions between impacts which could result in serious negative consequences?

The issue of uncertainty is an unavoidable and inherent component of every impact prediction (de Jongh 1988). To facilitate informed decision-making it is essential to explicitly acknowledge sources of uncertainty that remain. A requirement of the evaluation procedure is thus to specify the nature of predictions and indicate the basis upon which they were made, and where uncertainty exists.

There are various methods available for predictive analysis. Amongst the most commonly employed methods are case studies, modeling - conceptual, physical or quantitative models, field perturbation studies and laboratory experimental methods, surveys, theoretical considerations, expert opinion and local experiential knowledge.

The choice of methods should be guided by the nature of the impact, the level of accuracy of information required to make the prediction, the quality and reliability of the data sources, as well as available expertise and resources. For example, employing complex computerised models to generate exact predictions of pollution levels in an estuary, where information on baseline conditions is limited, or where decisions have been taken to ignore small, non-point pollution sources in the calculations, cannot be justified.

To assist with the more detailed questioning and exploration of the nature of the impacts, an Assessment Questionnaire has been designed (see Guideline Document 2). The Assessment Questionnaire contains questions that correspond directly to questions asked in the Briefing Questionnaire (see Table 6 for extract

from the Assessment Questionnaire). Furthermore, a series of Technical Advice Notes (TAN's) providing detailed technical information on various environmental characteristics and constraints placed on development activities by such characteristics, as well as typical responses of the characteristics or systems to human-induced changes, has been prepared and additional ones are in preparation (see Guideline Document 4 for an example of a TAN). Another key document which should be consulted is "Guidelines for Coastal Land-use" prepared by the Council for the Environment (1991). This document provides practical site-specific guidelines on developments located in the following environments; rivers, floodplains, estuaries, dunes, beaches, cliffs and steep slopes, rocky shores, marine sub-tidal areas and coastal islands. General environmental guidelines for coastal planning and development are also given.

**TABLE 6: EXTRACT FROM ASSESSMENT QUESTIONNAIRE**

<p><b>A. PROPOSED PROJECT IN RELATION TO THE BIO-PHYSICAL CHARACTERISTICS OF THE SITE</b></p> <p><i>Marine and Estuarine Site Characteristics</i></p> <p>8. Will any proposed development activities involve</p> <ul style="list-style-type: none"> <li>(a) modification of dunes,</li> <li>(b) disruption of sediment movement,</li> <li>(c) disturbance of marine life or</li> <li>(d) destruction of coastal vegetation which will result in detrimental environmental consequences?</li> </ul> <p><b>D. LANDSCAPE CHARACTER</b></p> <p>2.(a) Is the proposed development architecturally compatible with any developments in the area and does it suit the local landscape character?</p> <p>2.(b) Are materials to be used similar to those used in existing developments and/or those of the local area?</p>
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Of particular relevance to impact prediction and assessment of coastal resort developments is a consideration of whether environmental resources of the area can accommodate the anticipated recreational pressure generated by shoreline development without leading to unacceptable change. Whilst the Briefing and Assessment Questionnaires (Guideline Documents 1 and 2) require the proponent to explore and address questions relating to recreational use, it does not provide guidance on assessing the recreational carrying capacity of the area where

increased recreational pressure has been identified as a significant impact. It is recommended that a more detailed investigation be undertaken to determine whether the anticipated level of recreational use can be accommodated by the coastal resources of the area in terms of the space requirements of the activities, without progressively impairing biological productivity and ecological integrity and in a manner which will not adversely affect the recreation experience being sought.

A systematic approach for assessing the recreational carrying capacity of coastal resort areas has been developed (Sowman 1987) and is described in Guideline Document 5. These guidelines provide a practical step-by-step account of the tasks involved in undertaking the assessment. By following the proposed procedure the proponent should obtain an indication of the environmental suitability and social desirability of the development in terms of anticipated recreational pressure. Application of the proposed procedure to assist in determining the nature and scale of shore development that would lead to appropriate levels of recreational use in the Kromme River estuary in South Africa, is described in a paper (Sowman and Fuggle 1987) presented in Appendix 2 of this dissertation.

Where, time, resources and inadequate data provide constraints to undertaking detailed recreational carrying capacity studies, the proponent is advised to refer to "Space Standards for Major Coastal Recreational Activities" presented in Guideline Document 6. These standards provide guidance on the space requirements of the different coastal recreational activities. Reference to these space standards will provide some indication as to whether the physical space (both on water and land) available for recreational use is sufficient to support the activities of the users at a safe and efficient density. Whilst these standards are only concerned with the physical space requirements of the recreational activities, and do not address acceptable levels of use in terms of ecological and social considerations, they do at least provide a yardstick against which to assess whether projected recreational pressure can be physically accommodated in the area.

The assessment of recreational carrying capacity should reveal major constraints associated with projected levels of recreational use. For example, limited beach area and access to the sea due to an essentially rocky coastline may be identified as a

major constraint to further development in a coastal resort town. However, consideration of mitigatory measures to overcome this constraint, such as the construction of a tidal pool may be one way of overcoming this constraint. Obviously an assessment of the environmental consequences of constructing a tidal pool would need to be undertaken and the findings of the investigation considered in the final evaluation.

Reference to the relevant questions in the Assessment Questionnaire, (Guideline Document 2), consideration of technical information in the TAN's and where appropriate, following the procedure for determining recreational carrying capacity, will assist in streamlining the tasks of data collection, analysis and impact prediction. It may also reduce the need to undertake elaborate studies and analyses in the various impact categories under consideration.

The use of expert opinion and local experiential knowledge to assist with the task of impact prediction is highly recommended. South Africa has a high level of expertise in the natural and social sciences. These should be harnessed for the various tasks of the evaluation process. The wealth of knowledge and depth of understanding of environmental systems amongst traditional resource-dependent communities, as well as those with an interest in and concern for their environment (such as recreational fishermen or property owners in coastal villages) are a valuable resource, and should be used to guide the predictive analysis where appropriate.

### Assigning Significance

The next task in the evaluation procedure is assigning significance to the investigated impacts. For an evaluation method to achieve its objective, namely to inform decision-making, it is imperative that a distinction be made between determining the nature, extent, duration and social distribution of an impact, usually termed the magnitude of the impact, and determining its significance to society. The former is usually obtained by measurement and/or prediction and although subject to error, is usually based upon empirical measurement and objectively determined criteria (Lee 1982; Hollick 1986; Thompson 1990). However, determination of impact

significance usually involves a subjective value judgement and is an expression of the cost and value of an impact to society.

The challenge then is to devise a systematic, simple and acceptable method for assigning significance which relies on the value judgements of society - best obtained from a group of people elected to represent the wishes of society (Beanlands and Duinker 1983; Thompson 1990). Key considerations which must be addressed and incorporated in developing such a method include:

1. Achieving a balance between expert opinion and the values and priorities of society;
2. Confidence in the predictive analysis, usually undertaken by technical experts, so that this information can guide the determination of impact significance;
3. Identifying and eliminating those impact categories not valued or considered significant by society, since a reduced number of impact categories for each alternative will simplify the task of making trade-offs amongst alternatives;
4. Identifying and selecting a group of people who represent the values of society, and whose collective opinions will be respected and considered legitimate;
5. Providing clear guidelines and tools to members of the evaluation group regarding the procedures and steps to follow when assigning significance.

Two approaches to assigning significance and making trade-offs amongst alternatives are proposed. Both approaches rely on the collective judgements of a group of people elected to represent the values of society. The first approach requires the group, through a process of review, discussion and clarification to collectively agree on significant impacts. Information generated from this process is presented in a qualitative and semi-aggregated fashion. The second approach, termed the Significance Measurement Technique (Stauth 1989) is a systematic process for assigning significance in which the subjective value judgements are made explicit using numerical terms.

The choice of approaches should be guided by the complexity and controversiality of the proposal, by the decisions reached during the scoping process, time and financial considerations as well as characteristics (e.g. education levels) of elected group members and the cultural diversity of groups. The second approach, requires a level of conceptual understanding and sophistication which may not be appropriate in situations where panel members comprise individuals from disadvantaged groups. It is recommended that the principles and procedures of the two approaches be explained to the panel members and that they determine which approach would be the most appropriate to follow.

The first approach involves the following tasks:

1. Identification and selection of panel members who represent the wishes and values of the affected society;
2. Supplying panel members with relevant information on the proposed development, the affected environment and communities, as well as findings of the investigation and impact prediction stages in an accessible form;
3. Gathering panelists together in a workshop situation;
4. Identifying a facilitator acceptable to all parties;
5. Guiding panelists through an iterative process which allows discussion on impacts, questions of clarification on aspects of the investigation and analysis, considers the feasibility of implementing proposed mitigatory and optimization measures, allows additional information or new insights to be made known, and finally attempts to collectively assign significance. A Significance Assessment Category Form has been prepared to assist with this task (Table 7). Ideally the process of assigning significance should essentially be determined by the group. The group should agree on points of process including issues such as how decisions will be taken (for example consensus, sufficient consensus), how to deal with unresolved issues, how new information should be made known to the group (e.g. through written submission via the facilitator), how

much time should be afforded to each impact and so on. Certain groups may wish to develop a set of criteria to assist them in assigning significance or identify a threshold value below which impacts may be ignored. The process must allow for such proposals to be explored and where appropriate, developed.

**TABLE 7: SIGNIFICANCE ASSESSMENT CATEGORY FORM**

	Significant - Impact	Mitigation Yes/No	Significant Residual - Impact	Significant + Impact	Optimisa- tion Yes/No	Significant Optimised + Impact	Uncertain
Loss of habitat							
Destroys important cultural site							
Impairs scenic views							
Improves public access							
Creates jobs							

The key challenge to the group is to identify only those truly significant impacts associated with various alternatives so that the number of impacts is considerably reduced, thus allowing the decision process to be based upon a small number of trade-offs.

If impacts have been identified and assessed according to the categories in the Assessment Questionnaire (Guideline Document 2) then impact categories amongst various alternatives will be more easily comparable. It is proposed that the group systematically work through all impacts that have been investigated, and depending upon the agreed upon method of decision-making (e.g. based on identified criteria or discussion and further input) complete the Significance Assessment Category Form for each alternative. Panelists will have to consider the proposed mitigatory measures and decide whether the proposals are realistic, financially feasible and

environmentally appropriate before identifying whether the impact can be mitigated to insignificant levels or whether application of mitigatory measures cannot avoid or reduce the severity of the impact. If no appropriate mitigatory measures exist or if the application of proposed mitigatory measures cannot reduce the severity of the impact a significant residual negative impact is noted on the Significance Assessment Category Form.

The same process should be followed for identifying significant positive impacts. Panelists must consider the feasibility of applying proposed optimisation measures for enhancing positive impacts. Having considered the optimisation proposals the group must then identify and agree upon the significant optimised positive impacts and record these on the form.

It is recommended that where clear differences of opinion exist, or where uncertainty exists, further information should be requested. If this is not possible in the time period available, impacts should be regarded as significant and considered in the next stage of the evaluation process.

The second approach, the Significance Measurement Technique (SMT), is a technique for assessing the relative significance of a list of impacts generated by a panel of experts undertaking an environmental evaluation using the Panel Evaluation Method (PEM) developed by Stauth (1989).

For a detailed description of the theory and application of the SMT and the PEM the reader is referred to the paper "The Panel Evaluation Method - An Approach to Evaluating Controversial Resource Allocation Proposals" (Stauth, Sowman and Grindley 1993). The paper is presented in Appendix 3 of this dissertation).

This second, more quantitative approach to assigning significance features iterative procedures based on the principles of the Delphi Method (See Guideline Document 3 for a description of Delphi). The steps involved in adopting this approach are:

1. Identification and selection of panel members who represent the wishes and values of the affected society;

Stauth (1989) argues that there appears to be no way of establishing common ground at the upper end of the scale and suggests that less distortion in the aggregation of individual scores will result if scaling is done from the least important end of the scale. He suggests that an approximate zero point or starting point may be established if the list includes some impacts which are of little significance to members on the panel. If each individual identifies the lowest-ranked impact that is above his "threshold of significance" (i.e. the point at which valuation becomes meaningful), then the "threshold impact" can be regarded as a practical psychological datum point for subjective value judgements so that a reasonably objective scale for measuring these judgements can be derived. If panel members are unable to identify a "threshold impact" then additional impacts which were identified at the initial stages of the evaluation procedure, but were excluded from the investigation on the grounds of being insignificant, should be added to the list of significant impacts to assist with this weighting exercise.

An explanation of the steps to follow to accomplish the ratio-scoring procedure is given below:

1. Each panelist reviews the impacts on his/her list and gives a zero weight to any at the bottom of the list that, in his/her judgement, have no real significance to society. The lowest-ranked impact that has at least some significance, is assigned a weight of 10. This impact is now called the "threshold impact" and will be used as the standard against which the significance of all impacts ranked above it are compared (see Table 8).
2. Each panel member then gives a weight to the next most important impact on the list which indicates the ratio of its importance to the threshold impact. For example, if it is regarded as twice as important as the threshold impact, it is given a weight of 20.
3. The relative importance of the next impact on the list is then evaluated against the threshold impact and a weight is assigned that expresses its relative importance as a ratio.

**TABLE 8: EXAMPLE OF COMPLETED IMPACT WEIGHTING FORM**

RANKING	IMPACT LETTER	WEIGHTING
1	C	160
2	E	85
3	D	80
4	B	20
5	F	10
6	H	X
7	A	X
8	I	X
9	G	X
10	J	X

4. The panelist then makes a consistency check to ensure that the resulting ratio of importance between the impacts evaluated thus far is reasonable.
5. The procedure continues, with the panelist weighting all impacts against the threshold impact and making continuous consistency checks, until all impacts have been weighed and their relative importance is judged to be reasonable and consistent.

Once this procedure is complete, weighting scores of individual panelists are processed to obtain a group measurement of the significance of the impacts on an interval scale. Table 9 illustrates how individual scores are normalised and aggregated to obtain a group score.

The first step is concerned with normalising the group scores. The impact weights of each panelist are summed, individual weights divided by the sum, and each result multiplied by 100 to convert scores to a percentage scale. In the second step, the percentage scores of all panelists for each impact are summed, and the total divided by the number of panelists, to obtain an average weighting score for each impact. The relative significance of the impacts, as judged by the group, is thus obtained. The outcome of this rating, ranking and weighting exercise should provide a clear

quantitative indication of the significant impacts associated with the various alternatives.

**TABLE 9: NORMALISING GROUP SCORES: A WORKED EXAMPLE**

**Step 1: Individual Weighting**

	PANELIST P		PANELIST Q		PANELIST R	
Impact Letter	Impact Weight	Normalised Score (%)	Impact weight	Normalised score (%)	Impact weight	Normalised score (%)
A	500	64.9	10	7.7	150	25.5
B	160	20.8	10	7.7	60	10.6
C	80	10.4	20	15.4	300	53.1
D	20	2.6	35	36.9	30	5.3
E	10	1.3	30	23.1	15	2.7
F	0	0.0	25	19.2	10	1.8
TOTAL	770	100.0%	130	100.0%	565	100.0%

**Step 2: Group Weighting**

IMPACT							
Panelist	A	B	C	D	E	F	TOTAL
P	64.9	20.8	10.4	2.6	1.3	0.0	100
Q	7.7	7.7	15.4	26.9	23.1	19.2	100
R	26.2	10.6	53.1	5.3	2.7	1.8	100
TOTAL	99.1	39.1	78.9	34.8	27.1	21.0	300
Group Average weighting (%)	33	13	26	12	9	7	100

Regardless of which approach is employed, the outcome of the significance assessment stage will provide information needed to clarify trade-offs and select a preferred alternative. Information generated from the SMT will provide group weights

for the impact categories, and if impact categories are fully comparable amongst alternatives, these weightings will provide the decision-maker with an indication of the relative significance of the various impacts.

### Evaluating Alternatives

At this stage, it is recommended that the significant residual negative impacts and significant optimised positive impacts, termed selected significant impacts, relevant to each alternative be summarised in tabular form (see Table 10)

### *Clarifying Trade-Offs*

Most evaluation procedures leave the task of clarifying trade-offs and selecting a preferred alternative to the responsible and accountable decision-maker. However, it is recommended that the responsibility for this task should be determined during the initial scoping stage. For certain proposals, it may be appropriate that the group charged with assigning significance be requested to identify the alternative which would be in the best interests of the affected society. Should the decision-maker oppose the recommended alternative, he or she would be required to furnish reasons for selecting another alternative and record this in a record of decision (see Figure 3).

**TABLE 10: SUMMARY OF SIGNIFICANT IMPACTS ASSOCIATED WITH FOUR ALTERNATIVES**

ACTION ALTERNATIVE	IMPACT CATEGORIES						
	A	B	C	D	E	F	G
1	■			■			
2	■	■		■			
3	■		■		■		■
4	■					■	

The key task facing the evaluation group or decision-maker is to identify the environmentally and socially superior alternative; that option which will pose the least cost to society and distribute benefits most widely and over the longest time period.

Comparisons amongst alternatives are most easily achieved where impact categories are comparable and alternatives being compared refer to the same site. Determining whether such comparisons can be made will depend upon whether impact categories are sufficiently homogeneous, and whether or not impacts resulting from the various alternatives affect the same area and publics (Lee 1982). For example, the loss of habitat for migrant waders may apply to two alternatives. However, the area associated with one impact may be a RAMSAR site whilst the other may be considered by the local ornithological society to be an important site for birds. These impacts, whilst similar, are not strictly comparable. The loss of a RAMSAR site is likely to be of greater concern to society as a whole, than the loss of a site considered important by local people. It is therefore important to indicate clearly those impact categories which are strictly comparable and those which are not. Also it is essential that all uncertainties and assumptions be made explicit.

Having accomplished this, the evaluator(s) should systematically work through the alternatives, comparing the significant impacts associated with each alternative, to every other alternative, with a view to identifying the environmentally preferred one. Lee's (1982) simple and systematic approach to evaluating alternatives provides some guidance on how to tackle this task.

Assuming that the impact categories associated with the four alternatives in Table 10 are sufficiently comparable, the following simple process could be followed to ascertain the environmentally superior option.

Firstly, identify impacts common to all alternatives. This immediately reduces the number of impacts that need to be considered in the trade-off exercise. Next consider the impacts generated by alternative 1 relative to the impacts generated by each of the other alternatives, in turn.

Alternative 1 is clearly more desirable than alternative 2, since there are two common impacts (A) and (D), but implementation of alternative 2 will result in an additional impact (B). Next evaluate the cost to society of implementing alternative 1 versus alternative 3. Alternative 1 is environmentally superior to alternative 3 in all impact categories except (D). The question to ask is whether the superiority of alternative 1 in all impact categories except (D), more than compensates for its inferiority in category (D). Another way of asking this question is: will the environmental costs arising from impact (D) of alternative 1 be greater or less than the environmental costs associated with impact (C), (E) and (G) associated with Alternative 3. Unless impact (D) has far-reaching implications and is considered an issue of crucial concern, it is likely that Alternative 1 will be environmentally preferable to Alternative 3.

The final comparison is therefore between Alternative 1 and Alternative 4. Since impact (A) is common to both alternatives, a simple evaluation between two impacts is required. The kind of question to ask would be: which impact will result in the least environmental and social cost to society, impact (D) associated with alternative 1 or (F) associated with Alternative 4. The question could also be asked as follows: which alternative, considering the impact associated with each option, will result in the greatest benefits to society?

#### *Apply the Equity, Efficiency and Sustainability Criteria*

Once the preferred alternative has been identified using this simple trade-off process, three final evaluation criteria should be employed to confirm the choice of the preferred alternative. The following question could be asked: Is the selected alternative preferable in terms of efficiency, equity and sustainability considerations? This evaluation test, termed the Criteria Trade-Off Technique, has been developed by Stauth (1989) and is concerned with systematically comparing the effects of each alternative, or the two clearly superior ones, in terms of three evaluation criteria: efficiency, equity and sustainability. These terms are explained below.

- The "efficiency criterion" - an action is considered to be efficient if at least one member of today's society is made better off without anyone else being made

worse off. (An action may also be regarded as efficient if gainers could potentially compensate losers and still be better off).

- The "equity criterion" - an action is considered to be equitable if it results in a situation in which the distribution of costs and benefits to present members of society is considered to be fair and equitable and thus improved. (If gainers actually compensate losers so that the distribution of costs and benefits remains the same or is improved, then that action is both efficient and equitable).
- The "sustainability (or intergenerational) criterion" - an action has acceptable intergenerational effects if the prospects for improvements in future social well-being are not reduced. (If benefits are expected to exceed costs for future generations, then social progress will be sustainable). (Stauth 1989).

The task is then to evaluate which alternative best satisfies all three criteria taken together. If the outcome of applying these criteria confirms the choice made using the simple trade-off process, confidence in the selected alternative is enhanced.

#### *Prepare Draft Environmental Evaluation Report*

At this stage a Draft Environmental Evaluation Report (DEER) should be prepared by the proponent or his/her consultant. The DEER should be a concise document and should include relevant information and plans as requested in the Briefing Questionnaire (Guideline Document 2). Whilst the format of the DEER is largely at the discretion of the preparer, there are certain elements which must be covered in the report to fulfill the requirements set out in the Guidelines for Report Requirements (DEA 1992). A summary of these requirements, with slight modifications, is presented in Table 11.

**TABLE 11: SUMMARY OF REPORT REQUIREMENTS**

1.	Cover page
2.	Executive summary
3.	Contents page
4.	Introduction
5.	Terms of reference
6.	Approach to the study
	6.1 Screening Process
	6.2 Scoping Process
7.	Assumptions and limitations
8.	Administrative, legal and policy requirements
9.	Description and assessment of alternatives
	9.1 Proposed actions
	9.2 The affected environment
	9.3 Issues, impacts and community concerns
	9.4 Assessment of Impacts
	9.4.1 Predictive Analysis
	9.4.2 Assigning significance
10.	Incomplete or unavailable information, areas of uncertainty
11.	Evaluation of alternatives
	11.1 Clarifying Trade-Offs
	11.2 Apply efficiency, equity and sustainability test
12.	Conclusions and recommendations
13.	Definitions of technical terms
14.	List of preparers
15.	References
16.	Personal communications
17.	Appendices

*Based on Guidelines for Report Requirements (DEA 1992).*

## Review

Once the DEER has been prepared, it should be made available for review. Ideally, the adequacy of the environmental evaluation process followed and the reports submitted, in terms of objectivity, relevance and comprehensiveness should be undertaken by an independent review panel. This review panel should be acceptable to both the authorities and I&AP's and thus empowered to make recommendations to the responsible decision-making authority regarding the proposal and the DEER.

The CEEP makes provision for review by specialists, the public and responsible authorities. However, the review process, in terms of who should be required to assess the adequacy of the DEER, how the public will be informed and involved in

the review process, whether an independent review panel should be elected for this task, and if so, who should serve on this panel, should be determined through scoping. It is recommended that the following procedure be followed:

- (1) The public, two to three specialists and all relevant government agencies, be given an opportunity to comment on the proposals and the DEER;
- (2) These comments should be submitted to the independent review panel for consideration;
- (3) The panel then reviews the proposals and the DEER, considers the submissions and where necessary, requires the proponent to address inadequacies in the DEER, amend aspects of the proposal, revise the DEER, and where necessary, the proposal and plans. The review panel may request that the revised DEER be submitted for final review once outstanding issues have been addressed.
- (4) The review panel makes a recommendation to the responsible decision-maker.

Guidelines<sup>7</sup> to assist with the task of review have been prepared by the Department of Environment Affairs (1992). These guidelines are equally applicable to the CEEP and should be consulted. The purpose of these guidelines is to establish consistency in the review process and to clarify the role and tasks of reviewers throughout the process.

Following the review process, the DEER should be amended to address inadequacies and respond to comments, where they exist. Once these comments have been addressed, the Final Environmental Evaluation Report (FEER) should be prepared. In this document, it should be clearly stated how comments received from authorities, the public and specialists have been addressed. Recommendations of the review panel should also be documented.

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7. The author was one of the researchers responsible for compiling the Review Guidelines for the Department of Environment Affairs (1992).

## Decision

The recommendations of the review panel, as well as the responses of I&AP's and other responsible authorities to the proposal, should enable the responsible decision-making authority to make an informed decision.

The following decisions may be taken:

- The decision is deferred until a coastal policy, regional coastal plan or programme is prepared (refer Figure 1).
- The proposal is rejected.
- The proposal is approved.
- The proposal is approved, but with conditions attached.

It is anticipated that most approvals will be accompanied by conditions of approval. The conditions of approval will usually require the proponent to implement the proposed mitigatory or optimisation measures, prepare and adhere to a management plan, or comply with relevant policy, plan or legal requirements. In the case of township and resort development proposals, these conditions will usually refer to the construction phase of the project but may require post-construction action such as the restoration of sites or monitoring of certain parameters such as water quality or recreational pressure. An environmental contract may be required as a condition of approval. Such a contract ensures contractual control over development and penalties for not complying with the stated conditions. The contract would, for example, list required mitigatory and optimisation measures and identify associated penalties for not implementing measures. It is proposed that penalties for not complying with the stated conditions be negotiated with the proponent, relevant authorities and I&AP's.

The decision, as well as reasons for making the decision, should be recorded and available on request to any interested party. This brief document, referred to as a record of decision, should indicate how environmental considerations were taken

into account and weighed against other considerations such as technical and financial considerations. Documenting the decision in this way requires the decision-maker to take cognizance of environmental and community concerns and be guided by the judgements of those elected to represent the wishes of society. This encourages open and accountable decision-making and should lead to legitimate and acceptable decisions.

## **Appeal**

The CEEP, in keeping with the IEM procedures, provides an opportunity for an aggrieved party, be it the proponent, authority or member of the public to appeal against a decision. It is proposed that the appellant appeal to a higher administrative authority such as a review committee, and if this proves unsatisfactory to a court of law. Whilst the principle of appeal exists in IEM, clarity is needed on the procedures for lodging an administrative appeal and which bodies within government would be responsible for handling appeals. Some suggestions regarding these procedures and structures are put forward in the next section of this paper which deals with the proposed institutional framework for implementing CEEP.

Guidance is also needed on the circumstances or decisions which call for a judicial review and the procedures for instituting such action. Furthermore, for judicial review to serve the interests of the public, the requirements for *locus standi*, which are narrowly interpreted as persons having a direct personal interest in the decision, would have to be significantly liberalised.

## **Monitoring**

The establishment of a monitoring programme for all coastal developments is a requirement of the CEEP. Monitoring ensures that the project is progressing as intended and that the development takes place in accordance with conditions approval. It also provides valuable information regarding the accuracy of impact predictions, the effectiveness of proposed mitigation and optimisation measures, as well as a warning device to managers to take action if harmful trends are identified or unanticipated adverse impacts result.

Monitoring programmes will differ from project to project but will include one or more of the following objectives:

- To ensure that mitigation and optimisation measures are implemented during the construction phase;
- To verify impact predictions, thereby improving confidence in impact forecasting techniques, as well as our knowledge about impacts of various actions on specific environments;
- To check the efficiency of these measures and report changes in impact trends;
- To establish an on-going monitoring programme for selected environmental variables (e.g. water quality, recreational activity patterns) in order to identify the emergence of harmful impacts and alert managers to them so that they can take action to reduce or prevent them.

## **Auditing**

Environmental Auditing<sup>8</sup> is the systematic, periodic and objective evaluation of the environmental performance of the project once completed, with the aim of helping to safe guard the environment by:

- facilitating management control over practices affecting the environment;
- assessing compliance with relevant policies including regulatory requirements.

It is recognised that conducting a full environmental audit may not be appropriate for developments such as townships and resorts because of the complexity of the management systems operating in these areas and the multitude of authorities, at different levels of government, involved in some aspect of environmental

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8. This definition of environmental auditing is based upon the definition given by the International Chamber of Commerce, 1991.

management. However, it is recommended that the following activities, which comprise components of an environmental audit, be undertaken:

- evaluate how well the township or resort is performing in terms of compliance with relevant policies (e.g. coastal management policy), regulations (e.g. noise, boating controls) and standards (e.g. water quality criteria);
- evaluate whether the township's management systems including development control, service provision and maintenance, resource allocation and conservation, monitoring and communication systems, operate in an environmentally sound manner.

The value of undertaking these environmental audits is to reassess the environmental suitability of the project and provide constructive feedback to inform policy, programme and plan-making and assist in the evaluation of other development proposals of a similar nature.

## PROPOSED INSTITUTIONAL ARRANGEMENTS FOR CEEP

The institutional framework refers to the administrative structures, both government and non-governmental structures, legislative provisions, traditions and customs (referred to here as customary law)<sup>9</sup> within which CEEP can be implemented. Before focusing on the institutional arrangements for implementing CEEP, it is necessary to consider the overall institutional arrangements for implementing CZM efforts in South Africa generally, and the proposals that have been identified to improve the co-ordination and implementation of these efforts (Sowman 1993). In this paper, it was suggested that for national administrative purposes a Coastal Co-ordinating Unit be established at central Government level. Its main function would be to facilitate development of policy and management strategies, co-ordinate

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9. Although customary law is part of South African law, it has played a limited role in the management of the environment. However, given the strong traditional land tenure and resource allocation systems that exist in South Africa amongst traditional communities, it is likely that customary law will play a much greater role in environmental management including CZM, under a new dispensation.

the activities and efforts of various government departments responsible for aspects of CZM, to guide implementation of a CZM programme, monitor compliance of government departments with coastal policy goals and objectives and monitor and evaluate the effectiveness of an overall CZM programme.

The most appropriate location for this Coastal Co-ordinating Unit would be in a department already charged with CZM responsibilities, such as the existing Department of Environment Affairs. However, any suggestions regarding future administrative structures must take account of current debates regarding the restructuring of government departments in South Africa, and what their roles and responsibilities might be. One proposal emanating from the Environment Desk of The African National Congress (ANC 1993 unpublished) is that a single government department - a Department of Planning, Development and Environment - be created to ensure the effective integration of environmental considerations in the planning and development process. Whilst details regarding the divisions within such a department are still being debated and are unclear, it is proposed that the Coastal Co-ordinating Unit should be located within this department, with a relatively small unit at central government level and regional offices established in the coastal regions as defined by the new constitution. This would be in keeping with the proposals to grant wide powers to regional governments.

It is argued that the monitoring and implementation of an integrated CZM programme or aspects of such a programme, would best be achieved at this regional level (Glazewski 1993 unpublished). It is envisaged that the CEEP would constitute one of the key management strategies for achieving the goals of an integrated CZM programme in South Africa. It is consequently recommended that it be administered at this regional level. The role and responsibilities of the coastal units within these regional offices in terms of implementing the CEEP would be (i) to provide input into the initial planning stages concerned with defining the need and developing the proposal, (ii) to participate in the initial scoping exercise, and (iii) to review the DEER and FEER and make a final decision based on the recommendations of the review panel.

Whilst the scoping process will determine whether the final decision should be taken at the local, regional or national level, it is anticipated that those coastal developments that will result in significant impacts and are therefore required to follow CEEP, will be submitted to the appropriate regional coastal unit for review. The regional units would also be responsible for issuing permits to proceed with the development and monitoring the implementation of the development.

It is unlikely that the local offices of the Department of Planning, Development and the Environment would have a division dedicated to coastal management, except perhaps in the coastal metropolitan areas. In terms of implementing CEEP, it is recommended that the local offices of the Department of Planning, Development and the Environment be involved in the initial stages of the planning process, in particular with regard to defining the need or problem to be addressed, and identifying possible alternatives and issues requiring consideration. However, their continued involvement in the procedure should be determined by the scoping process. It is further recommended that all DEER's be submitted to the local offices for comment and that due consideration be given to these comments. The involvement of local government officials in implementing CEEP is necessary because of their knowledge of local conditions, as well as problems and opportunities existing in the local coastal environment. Since these local offices are ultimately responsible for environmental management in the area, they should also have an input in assessing the environmental suitability of developments which affect their areas of jurisdiction.

The National Coastal Co-ordinating Unit should be involved in the initial planning and review stages of all proposals affecting coastal resources and areas which are of national importance and concern. The exact tasks of the Co-ordinating Unit with respect to a particular proposal should be determined through scoping.

In order for CEEP to be effective, it will require legislative support. The first approach outlined below is in line with proposals made for giving IEM the force of law (see Sowman et al. in press). A mandatory requirement that environmental evaluations be undertaken for all coastal township and resort development proposals could be achieved through harnessing certain provisions in the Environment

Conservation Act 73 of 1989. Firstly, Section 21 of the Act empowers the Minister to identify activities which are likely to result in detrimental effects on the environment. Townships, resorts and recreational developments could be identified as such activities. Section 22 prohibits the undertaking of such identified activities without written authorization of the Minister or delegated authority and after consideration of an environmental evaluation report. Secondly, the Minister may make regulations regarding environmental impact reports, in terms of the scope and content of such reports, the drafting and evaluation of reports and monitoring of activities (Section 26). However, it must be noted that this section does not explicitly make provision for making regulations concerning what procedures to follow when preparing such reports and what the elements and requirements of such a procedure might be.

In this respect, the promulgation of regulations relating to limited development areas (LDA's), may be more appropriate for implementing CEEP (Section 23). This section of the Act empowers the Minister to make regulations concerning the procedures to be followed in order to obtain permission to undertake development activities in such areas (Section 27). Should the entire coastal zone, or sections of it, be declared a LDA (Section 23), regulations can be promulgated requiring that developments located in a LDA be subject to the principles and procedures outlined in CEEP.

The other legislative basis for CEEP could be provided in a new CZM Act. The promulgation of a separate Act of Parliament which deals specifically with matters relevant to CZM has been widely advocated (Rabie 1990; DEA 1991; Glavovic 1991; Presidents Council 1991; Heydorn et al. 1992). The advantages of declaring such an Act have been discussed elsewhere in this dissertation (Sowman 1993). However, there remain questions amongst certain coastal stakeholders regarding the appropriateness of declaring a CZM Act and further debate on the purpose and ambit of such an Act is required.

Since regulations can be readily and easily promulgated and amended to suit changing situations, the promulgation of regulations in terms of the Environment Conservation Act as suggested above, is recommended. The regulations must

stipulate that the procedures outlined in the CEEP be followed when undertaking evaluations of and preparing reports on townships and resorts located in the coastal zone.

To date there is limited experience regarding the role that customary law could play in evaluating development proposals. However, given the emphasis that CEEP places on the role of the public in all aspects of the process, it is anticipated that customary law will increasingly play an important role in informing the evaluation and decision-making process. This reinforces the need to adopt an open and participatory approach throughout the evaluation process.

## CONCLUSIONS

The evaluation procedure developed and discussed in this paper has attempted to advance the state of the art of EIA and improve its effectiveness as an instrument of coastal management. The CEEP together with the six practical guideline documents which follow provide an overall package for undertaking environmental evaluations in developing countries such as South Africa.

In general, the CEEP is consistent with the principles and procedures of IEM, but goes further than IEM in that it requires an evaluation of the alternatives to be undertaken and recommends that a review panel make recommendations to the relevant decision-making authority. In particular, it stresses the importance of initiating and sustaining appropriate and acceptable processes for accomplishing certain tasks and suggests how these processes can be made operational. An attempt is made to address those procedural and methodological weaknesses inherent in most EIA systems in developing countries not explicitly addressed in IEM.

To facilitate the implementation of the CEEP a variety of tools, including criteria, methods and practical guidelines have been developed. It is submitted that the CEEP, together with the various tools and guidelines discussed in this dissertation provide an overall package for undertaking environmental evaluations of any

proposals affecting the coastal environment which is cost-effective and easy to apply in terms of available resources, expertise and data in a developing country such as South Africa.

Although not fully tested, it is believed that the implementation of CEEP will have low financial resource requirements since the participants in the evaluation procedure (the proponent or consultant, authorities and I&AP's) will be able to draw on extensive tools and practical guidelines that have been developed.

Furthermore, the entire evaluation procedure should ideally be guided by a scoping committee comprising representatives of relevant authorities and I&AP's. It is likely that individuals with specialist knowledge as well as those with traditional or local experiential knowledge will serve on such committees. It is envisaged that expert input will mainly be required during the impact prediction stage and then only for issues and impacts considered to be significant and worthy of specialist investigations. The development of TAN's for all impact categories identified in the Briefing Questionnaire will further facilitate its cost-effective application.

Given the socio-political circumstances in South Africa, the proposed institutional arrangements for implementing the CEEP are tentative. However, they are consistent with political restructuring occurring in South Africa at present, legislative proposals for streamlining CZM efforts, and calls for restoration of customary rights and empowerment of local communities.

Since the CEEP has not yet been fully applied to a coastal development proposal, it is not possible to adequately evaluate its utility and effectiveness. Thus the next stage in the development of this procedure should be its practical application, evaluation and refinement.

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#### PERSONAL COMMUNICATION

- Mr C. Heydenrych, Land Development Co-ordination, Cape Provincial Administration. August 1993.
- Dr E. Heath, South African Tourism Board (SATOUR), September 1993.

# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 1

### BRIEFING QUESTIONNAIRE

This Briefing Questionnaire has been developed to assist project proponents, consultants, decision-makers and the public with the following tasks:

- (1) describing the project actions and the affected environment;
- (2) identifying significant issues, and impacts including positive impacts and community concerns associated with the proposed development;
- (3) focusing the investigation on only the significant issues, impacts and concerns, and
- (4) presenting information in the environmental evaluation report in a logical and structured manner to facilitate review and decision-making.

The Briefing Questionnaire poses a list of questions regarding the nature of the proposed development in relation to the environmental characteristics and conditions of the site and surrounding area, the likely impacts of the proposed development on that environment and whether the existing environmental characteristics and conditions pose any constraints to implementing the proposed development.

Whilst this list of questions attempts to be comprehensive, it is not exhaustive. It provides a core of questions that should be addressed when undertaking the task of impact identification. It is likely that other environmental considerations may be pertinent to specific development proposals and additional questions may need to be asked.

The broad interpretation given to the term environment, that is one that includes physical, biological, social, economic, cultural, historical and political components will inevitably require input from experts throughout the evaluation process but in particular during those stages concerned with the identification, investigation and prediction of significant impacts. Information obtained from specialists pertinent to significant impacts should be extracted from specialist reports, where these have been prepared, and included in the overall environmental evaluation report. Where appropriate, specialist reports may be appended to the Final Environmental Evaluation Report.

## SECTION I

### A. PROPOSED DEVELOPMENT PROJECT IN RELATION TO THE BIO-PHYSICAL CHARACTERISTICS OF THE SITE AND SURROUNDINGS

#### Geology and Soils

1. Please give a brief description of the following:

- (a) Topography of the site (e.g. gently undulating with occasional rocky outcrop etc.).
- (b) Dominant geological formations (e.g. Table Mountain sandstone, calcareous sands etc.).
- (c) Type of soils (e.g. well-drained, dry, sandy soils; rock and thin, stony soils etc.).
- (d) Potential of soils on development site for agricultural purposes.
- (e) Depth to bedrock.
- (f) Unique geological or physical features on or adjacent to the site.
- (g) Do any of the above features impose constraints on the proposed development, and if so, please indicate how these problems will be overcome?

2. Please give details of any large scale excavations or earthmoving activities envisaged. Indicate the total area that will be affected by the operation, what machinery will be used, the estimated duration of these activities, the quantity of material that will be removed, and the place and method of disposal.

3. (a) Where will materials for construction activities such as road surfacing, fill etc. be obtained? (Please indicate site(s) on layout or locality plans).
- (b) Are these areas infested by alien plants?
- (c) Please indicate whether there are any proposals to rehabilitate such sites, and indicate who will undertake and finance the restoration programme?
4. (a) Will any structures be built on slopes with a gradient steeper than 1:5?
- (b) If YES, please provide details of any investigations that have been undertaken to ascertain whether the slopes are prone to slumping, sliding, rockfalls or erosion.
5. (a) Will the gradient of any access roads to, or within, the proposed development site be steeper than 1:8?
- (b) : If YES, please give reasons why it is not possible to avoid such steep slopes.

#### **Marine/Estuarine Site Characteristics**

6. Please give a brief description of the coastal area adjacent to or in the vicinity of the site (e.g. predominantly sandy beach with occasional rocky outcrops, backed by undulating mobile sand dunes etc.).
7. (a) Will the proposed development involve any modifications to the shoreline, estuarine banks or river mouth? (e.g. landscaping slopes to beach).
- (b) If YES, please give details of any proposed modifications.

8. Will any proposed development activities result in:
  - (a) modification of dunes (e.g. stabilization of dunes);
  - (b) disruption of sediment movement (e.g. structures located in path of wind-blown sand);
  - (c) disturbance of marine life (e.g. vehicles on the beach), and/or
  - (d) destruction of coastal vegetation (e.g. removal of Milkwood trees)?
  
9. (a) Will the proposed development involve any dredging operations?
  - (b) If YES, please provide the following information:
    - i) A map showing all areas to be dredged (see Section III).
    - ii) The reasons for dredging activities.
    - iii) The quantity of material to be removed.
    - iv) The machinery that will be used.
    - v) The duration of the dredging operations.
    - vi) The site where the dredge spoil will be deposited.
  - (c) Will maintenance dredging be necessary on completion of the proposed development?
  - (d) If YES, who will undertake the maintenance dredging and who will finance the operation?

10. Is there likely to be increased nutrient run-off into the estuary or coastal waters due to development activities (e.g. from stormwater runoff, septic tank seepage)?
11. Is there any possibility that the development will interfere with tidal flushing of the estuary due to the construction of structures such as harbour walls, canals, or activities such as dredging?
12. Please indicate to the best of your knowledge whether the prevailing surf and tidal conditions are safe for swimming and other water-based recreation activities such as surfing and water-skiing (e.g. mention should be made of any strong longshore and rip currents, dangerous rocks in swimming area etc.).

### **Water**

13. (a) Are there any surface water features such as vleis, streams, springs, seeps, wetlands or floodplains on or adjacent to the land under consideration?
- (b) If YES, please indicate whether and to what extent any surface water features will be modified or destroyed (e.g. filled in) by the proposed development and, if so, explain why this cannot be avoided.
14. (a) Are the drainage patterns of the site discernible?
- (b) If YES, will construction activities, siting of structures, road alignments etc. alter or disrupt drainage patterns?
15. (a) Is the proposed development situated on land where there are any known groundwater resources?

- (b) If YES:
- i) Please give details of any tests conducted by professional hydrologists or any other persons (please identify) to determine the quantity and quality of groundwater resources in the area or state the lack of such tests. (Please submit hydrologists report if available).
  - ii) Is the proposed development likely to result in changes in groundwater quantity and/or quality?
  - iii) If YES, please describe the anticipated changes.
16. (a) Will development activities result in the clearing of vegetation resulting in hardened or paved surfaces?
- (b) If YES, is it likely that the increased run-off could result in problems such as flooding, erosion, changes in river flow, etc.?
17. Will the development pose any threats to hydrological functioning through:
- a) pollution/eutrophication;
  - b) changes in siltation rates;
  - c) water diversion/extraction/impoundment;
  - d) canalisation, and/or
  - e) flood control berm construction?

18. (a) Is the land under consideration subject to flooding or any tidal action?
- (b) If YES, please indicate the 1:50 year or 1:20 year floodline on the layout plans (see Section III).

### Ecological Considerations

19. (a) Please give a brief description of the vegetation on the proposed development site.
- (b) Are there invasive alien plants (i.e. exotic plants, introduced from other countries, such as Rooikrans and Port Jackson) on the land under consideration?
- (c) If YES, what percentage of the land is infested by invasive alien plants?

0-5%	5-25%	25-50%	50-75%	75-100%
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20. What area of vegetation will be cleared for the proposed development? Please indicate what percentage of vegetation to be cleared is indigenous and what percentage is alien vegetation.
21. Could construction activities result in the introduction of invasive alien plants to the area?
22. (a) Does the area provide habitat for any "threatened" plants, animals or birds?
- (b) If YES, please give details and supply the source of information.

23. Are there any local communities who use the ecosystems on or adjacent to these sites to obtain food plants, medicinal plants, wood, and/or animals for food?
24. Will increased human activities resulting from the development (such as walking, off-road vehicular use, fire wood collection) result in trampling or destruction of adjacent plant communities?
25. (a) Will new roads, fences and/or transmission lines interfere with the natural movements of local animals and birds?  
  
(b) Will the development and human activities generated by the development (e.g. recreational activities) interfere with sites used by migrant or non-resident animal or bird species?
26. Please describe any unusual or special natural features (e.g. waterfalls, caves etc.) which are on or adjacent to the site. Indicate how these features may be affected by the development.

#### **Nature and Level of Present and Future Environmental Pollution**

27. (a) What are the present sources of environmental pollution?  
  
(b) Will the development and associated activities contribute in any way to increased levels of environmental pollution (water, air, noise, visual including lighting, disposal of solid and liquid waste)?

## B. PROPOSED PROJECT IN RELATION TO LAND-USE ACTIVITIES AND SOCIO-ECONOMIC CHARACTERISTICS IN THE AREA

### Land-Use Activities

1. (a) Please describe for what purpose the land in the area surrounding the proposed development is used (e.g. protea farming, coastal resort comprising 20 holiday cottages, etc.). (Land uses on surrounding properties must be indicated on the locality plan, see Section III).
- (b) Will the proposed development in any way affect (both positively and negatively) the surrounding properties (e.g. dust from construction activities depreciate property values)?
2. (a) Are there any political considerations such as historical rights (e.g. rights granted to communities living on state land) or land claims (e.g. communities forcibly removed in the past) associated with the development site?
- (b) What steps have been taken to address these claims/rights with the affected communities?
3. Please name the nearest settlement, town or village and nearest major urban centre to the development. Give a brief description of the nearest settlement and indicate the distance in kilometers from the proposed development.
4. Where the proposed development abuts (or is in close proximity to) an existing coastal town, township-extension or holiday resort please provide the information requested below. (This information should be easily obtainable from the local authority).

- a) The date the township was proclaimed.
- b) Total number of erven.
- c) Total number of developed erven.
- d) In the case of holiday resorts, indicate the total number of holiday cottages, flats, etc. available and the approximate number of people that could be accommodated by these facilities.

### **Socio-Demographic Characteristics**

5. Please give an estimate of the population in the vicinity of the development site. If possible, give estimates of population numbers out of season (and if possible indicate the number of permanent residents) and during peak holiday periods.
6. : Where possible, give an indication of the anticipated increase in number of:
  - a) permanent residents, and
  - b) holiday-makers to the area should the development proceed.

### **Local and Regional Economy**

7. What is the economic base of the area?
8. Are any commercial or business sector ventures (e.g. boatyards, eco-tourism operators) associated with this development proposal?
9. What are the financial implications of this proposed development for the local authority (e.g. costs of supplying services, income from rates)?

10. What are the implications of this development for the local and regional economy?

### **Employment Characteristics**

11. Please provide information on the projected employee requirements for the project:
- a) Number of professional employees.
  - b) Number of skilled workers.
  - c) Number of unskilled workers.
  - d) Number of other employees (please specify).
12. (a) Approximately what percentage of the labour requirements will be supplied by the local people and what percentage by non-locals?
- (b) If no local people will be employed during the construction phase of the project, please give reasons for this.
- (c) During the construction phase is there likely to be a significant influx of non-local labour to the area?
13. (a) Will accommodation and facilities (e.g. piped water, toilets etc.) be provided for the workforce?
- (b) If NO, why are no facilities being provided for the workforce?
- (c) If YES, please provide the following information:

- i) Type of accommodation provided (e.g. mobile homes, corrugated iron houses, etc.).
  - ii) Facilities that will be provided.
  - iii) Area of land set aside for accommodation and facilities.
  - iv) Number of workers that will be accommodated.
  - v) Indicate the location of the housing and facilities for the workforce on the layout plan (see Section II).
  - vi) Indicate whether the facilities provided for the workforce will be removed and the site restored on completion of the project.
14. What is the likelihood of non-local labour remaining in the area after the construction phase of the development is completed?
15. (a) On completion of the construction phase of the project will employment opportunities arise for local labour as a direct result of the project?
- (b) If YES, please provide details.

### **Community Cohesion, Values and Lifestyles**

16. (a) Are there identifiable groups (e.g. pensioners, disadvantaged groups such as informal settler communities) that may be affected by the development?
- (b) If YES, in what way will they be affected?

17. Will the development and associated construction activities affect community life or cohesion through, for example, physical or psychological separation of activities or residents, disruption of certain segments of the residential or business community, the need for vehicular or pedestrian detours, or any other disruptive activities?
18. Will the proposed development affect traditional lifestyles (including traditional uses of resources) and values?
19. Will the proposed development create expectations (e.g. employment opportunities, improved standard of living) amongst local communities?

#### **Recreational Patterns of Use and Facilities**

20. Please provide information on the recreational patterns of use in the study area including the major types of activities pursued, the localities favoured for the different activities, the levels of crowding experienced and the condition of the environment as a result of these current patterns.
21. Please provide the following information about existing and proposed recreational facilities (e.g. boat ramps, playground equipment etc.) and the public or private open space system(s). Please indicate the location of these on the layout plan.
  - (a) A general layout plan showing the location of the existing and proposed facilities as well as the open space system(s).
  - (b) Description of the proposed facilities.
  - (c) Please provide a separate scaled and dimensioned plan of the facilities and, where appropriate, elevations.

- (d) Details of any proposed modifications to the land (e.g. clearing vegetation) or shore (e.g. excavating boulders).
- (e) Indicate who will be responsible for the maintenance of the facilities and open space system(s) and who will bear these costs.

22. Who will have access to these facilities:

- a) only property owners/holiday-makers associated with the proposed development;
- b) all property owners and holiday-makers in the area, and/or
- c) the public?

23. Where no additional recreational facilities are being proposed, can the environmental resources of the area, as well as existing facilities cope with : increased recreational pressure generated by the proposed development?

### **Transport Networks**

24. (a) Is the proposed development site accessible via existing road networks?
- (b) If YES, please indicate the status of the road which links the development site to a National or Main Route (see Section III).
- (c) If NO, please indicate what access will be provided to the site and who will finance the road building operation.
25. (a) Is the development likely to result in a marked increase in volume of traffic in the area?

- (b) If YES, please indicate whether the increase in traffic will be:
  - i) throughout the year;
  - ii) only during peak holiday seasons; or
  - iii) all year round, but increased during peak holiday seasons.
  
- 26. (a) Are there any proposals to improve road networks in the area (e.g. build additional access roads, upgrade existing minor roads) to meet the increased traffic requirements?
  
- (b) If YES, please provide details. Indicate who will finance the road building project.
  
- 27. What parking facilities exist (or will be provided) at water-based and/or land-based recreation sites? (Please indicate the location and extent of the parking areas on the layout plans (see Section III).

#### C. PROPOSED PROJECT IN RELATION TO CULTURAL AND HISTORICAL RESOURCES

- 1. (a) Are there any sites or resources of archaeological, historical or cultural (including spiritual or religious) value on, or in the vicinity of, the proposed development site?
  
- (b) If YES, please indicate whether any of these sites, resources or buildings are protected by the National Monuments Act 28 of 1969.
  
- (c) Will any of these sites or resources be disturbed or degraded by the proposed development?

- (d) Will access to or use of these sites or resources be affected by the proposed development?

#### D. LANDSCAPE CHARACTER

1. Where the proposed development scheme abuts (or is in close proximity to) an existing development (coastal town, resort, etc.) please provide information:
  - a) General layout of the existing development(s).
  - b) The scale and density of the existing development(s).
  - c) Materials used in local buildings.
  - d) Existence of local vernacular architecture (i.e. a characteristic design theme).
2. Please provide a brief motivation for the proposed layout, building styles and materials used. Indicate whether and how the proposed development is architecturally compatible with existing developments and local landscape character.
3. Where the application is for approval to subdivide land into plots for sale to private owners for development, please indicate what provisions have been made to ensure that:
  - (a) building development will take place within a reasonable period (e.g. a building clause imposed with conditions of sale), and
  - (b) buildings and other modifications to the landscape will not be obtrusive, intrusive or aesthetically displeasing.

4. (a) Are any parts of the proposed development located in an exposed position, visible to many people (e.g. on a ridge line), or is it completely sheltered from public view by existing landform or vegetation?
- (b) Where a proposed development will modify scenic views and vistas please indicate:
  - i) what groups will be affected (e.g. neighbouring communities, local property owners, road users, etc.);
  - ii) how their views will be affected, and
  - iii) What landscaping actions will be undertaken to achieve harmony between the development and its surroundings?

## E. INFRASTRUCTURAL SERVICES FOR THE PROPOSED DEVELOPMENT

Please provide the following information regarding services for the proposed development. Indicate who will be responsible for the provision and maintenance of the services and who will pay for them (e.g. developer, local authority, costs shared by developer and local authority). Where applicable give details of existing services supplied to the area and whether it would be possible to extend these services to the proposed development.

### **Domestic Water Supply**

1. (a) Indicate the adequacy and reliability of the proposed water supply to meet demand, especially the anticipated demand during peak holiday season.

- (b) Where boreholes will supply water please provide certificates of borehole capacity (litres/hour) and water quality. Where the building of a storage dam or other structure is required please indicate the location on the layout plans and give the scale and dimensions of the structure(s).

### **Sewage Disposal**

- 2. (a) Where the development will link onto an existing sewerage reticulation system please indicate the efficiency and capacity of the facility to cope with the additional load.
- (b) Where a septic tank system is proposed please supply information on soil and slope conditions and indicate what research has been done to establish that the conditions are suitable for a septic tank system. Give details regarding the location of the septic tanks in relation to the source of domestic water supply, other water courses and groundwater resources.

### **Source of Electricity**

- 3. (a) Is electricity supplied to this area?
- (b) If YES, is the existing reticulation and source capacity suitable and sufficient to supply electricity to the new development? Where source capacity is insufficient, what infrastructural developments are required to supply electricity to the new development site?
- (c) Where building of a substation is required please indicate the location of the substation on the layout plans. If an existing mains connection is to be extended please indicate the take-off point and site(s) of distribution point(s).

- (d) If the proposed development will result in electricity being supplied to the area for the first time, what is the attitude of the local community to this?

### **Refuse Collection and Disposal**

- 4. (a) Provide information on how, when and by whom refuse will be collected, and where it will be disposed (where applicable indicate the refuse disposal site on the layout plans).
- (b) Will the level of service provision be adequate or will it be increased during peak holiday seasons?

### **Stormwater Drainage and Discharge**

- 5. Please indicate the stormwater drainage system and point(s) of stormwater discharge on the layout plans.

### **Linkage to Telecommunications Network**

- 6. (a) Will the proposed development be linked to existing telecommunication networks?
- (b) If YES, will this require the installation of additional telecommunication lines or facilities?

### **Emergency Services**

- 7. (a) What emergency services (e.g. fire and ambulance services) are used in this area? Are these services adequate to meet anticipated demand?
- (b) Is there a need for additional emergency services such as flood management plans, crime watch, etc?

## F. HEALTH, SAFETY AND RISK CONSIDERATIONS

1. Will the development or associated construction activities result in increased dust, noise, traffic or other nuisances which may negatively affect health or reduce safety?
2. (a) Is the development located in a high risk area in which episodic short-term events such as sea storms or longer-term environmental changes such as sea-level rise, pose a high risk to development?  
  
(b) What measures will be taken to minimize these risks?
3. Could the siting of the proposed development pose any risk to surrounding properties (e.g. structures which may result in back flooding, or boating activities resulting in undercutting of banks)?

## G. CUMULATIVE AND SYNERGISTIC EFFECTS

1. Should the development proceed, are any cumulative and/or negative effects anticipated?
2. Could the proposed development reduce the ability of the natural and social environment to assimilate cumulative stresses placed on it from this and other developments?

## H. PUBLIC INVOLVEMENT

1. Please indicate the nature and extent of public involvement in the planning, assessment and review of the development proposal.

2. (a) Does existing legislation require that this application for development be advertised? If YES, please attach a copy of the advertisement and name(s) of newspapers and gazettes in which the advertisement(s) appeared and give dates of publication.  
  
(b) Have the plans and information regarding the proposed development been made available to the interested and affected parties; if so where?
3. (a) Was the Draft Environmental Evaluation Report made available for public review?  
  
(b) If YES, where was it placed and what time period was given for comment?
4. What were the major areas/issues of concern and how were these addressed in the final report?

**SECTION II****1. Particulars regarding the applicant:****Name:****Address:****Postal Code:****Telephone Number:****Dialling Code:**

- 2. (a) Is the applicant the registered owner of the property under consideration?**
- (b) If NO, please provide the name(s) of registered owner(s). (Where the applicant is not the registered owner, please supply evidence that valid authority to submit this application has been granted by the owner).**

**3. Please provide the following details:**

- a) Official designation of the property.**
- b) Total extent of the property.**
- c) The total area that will be developed.**
- d) The proposed name of the holiday township/resort.**
- 4. (a) Does the title deed of the property contain any servitudes, rights or bonds (in favour of any other person(s)) or any restrictive conditions which may affect this application?**

- (b) If YES, please provide details.
5. Please provide a brief motivation of the need for this proposed development. Indicate the grounds which suggest that a demand exists for this type of development in this area.
6. What local authority has jurisdiction over the land under consideration? In what way has the local authority been informed and involved in the development and assessment of this proposal?
7. (a) What is the current zoning of the land unit under consideration?
- (b) In what year was this land unit zoned?
- (c) Will the proposed project require that the existing zoning be changed?
- (d) If YES, what rezoning is proposed?
8. (a) Does a structure plan exist or is one in preparation which covers the land under consideration?
- (b) If YES, is the proposed development consistent with the aims and objectives of the structure plan? If the answer to Q.8(b) is NO, please provide the motivation for proposing a land-use which is not consistent with the structure plan.
9. (a) Does the land under consideration fall within an area governed by a guide plan in terms of section 6(a) of the Physical Planning Act 66 of 1967?
- (b) If YES, does the proposed project comply with the guide plan? Where the proposed land-use is not compatible with guide plan please give reasons

why you consider the proposal to be preferable and indicate how it may better serve the community.

10. Is approval necessary in terms of any of the following Acts?

- (a) Removal of Restrictions Act 84 of 1967.
- (b) The Physical Planning Act 88 of 1967.
- (c) Subdivision of Agricultural Land Act 70 of 1970

Please attach a copy of approval from the relevant authority where applicable.

11. (a) Does the applicant (or owner where the applicant is not the owner) possess any adjoining land or land in the immediate vicinity of the property under consideration?
- (b) If YES, please indicate whether the applicant has any intention of applying for permission to develop or subdivide this land in the future? Please indicate the location and extent of the land on the locality plans (see Section III).

## SECTION III

### PLANS TO BE SUBMITTED WITH THE APPLICATION

#### 1. Regional Plan

A copy of the 1:50 000 topocadastral series for this area should be submitted. It is suggested that a map drawn to a scale of 1:500 000 or 1:1 000 000 be inserted on the regional plan to place the proposed development site in a regional perspective. The following information should be clearly indicated on the regional plan:

- (a) True north.
- (b) All local authority boundaries.
- (c) Settlements, towns, township-extensions and coastal resorts in the surrounding area.
- (d) Location of the applicant's property.
- (e) Location of all roads, in particular the access road which links the development site to a National or Main Road.
- (f) Location of national parks, nature reserves and nature areas.
- (g) Any other features which may be relevant to this application.

#### 2. Locality Plan

A copy of the 1:10 000 orthophoto should be submitted for this section. The following information should be clearly indicated on the orthophoto:

- (a) Boundaries of the land unit under construction.
- (b) Location and extent of any other property belonging to the applicant in the immediate surroundings.
- (c) Land-use practices on surrounding properties.
- (d) All roads (indicating their status), including the access road(s) to the proposed development site.
- (e) Local Authority boundaries.
- (f) Any approved subdivisions in the area.
- (g) Source of water supply.
- (h) Existing telecommunication lines, powerlines, pipe lines, refuse disposal sites.

Where applicable, please indicate the sites for the following activities relating to the proposed development:

- (i) Electricity sub-station.
- (j) Water supply infrastructure developments.
- (k) Excavation of materials for construction activities.
- (l) Deposition of excavated material, dredge spoil etc.
- (m) Telecommunication lines, power lines, pipelines.

(n) Refuse disposal dump.

(o) Sites for any other activities which may be relevant to this application.

### **3. Layout Plan**

A plan drawn to the scale of 1:500, 1:1 000 or 1:2 000 (whichever is the most appropriate) should be submitted indicating the following information:

(a) True north.

(b) Boundaries of the applicant's property clearly marked.

(c) Contours at 1m or 2m intervals of all land which is to be subdivided or built upon. (The contours should extend to at least 100m beyond the layout boundary).

(d): All the cadastral boundaries of properties adjacent to the proposed layout. Surrounding erven should be colour-coded according to the relevant zoning for the area, to a minimum distance of 100m from the layout boundary.

(e) Physical features such as wetlands, streams, vleis, springs, dunes, rocky outcrops, caves, waterfalls etc.

(f) All existing and proposed human-made structures such as buildings, roads, railway lines, dams, telecommunication lines, power lines, pipelines, bridges, recreational facilities, historical and archaeological sites.

(g) Location of any registered servitudes or right of way.

- (h) Reclaimed or filled-in areas and areas subject to flooding. (The 1:20 year or 1:50 year floodline, whichever is applicable in terms of the Water Act 54 of 1956, should be indicated);
- (i) The proposed subdivisions:
  - i) all erven must be numbered consecutively, and
  - ii) erven should be colour-coded according to their proposed land-use e.g. open space, zone I, residential zone I etc.
- (j) All existing and proposed roads within the boundaries of the layout as well as all adjoining roads. Indicate the status, widths and gradients of all roads either on the plan or on a legend.
- (k) The proposed names of the streets. (Street names require the approval of the Local Authority).
- (l) A schedule or legend of proposed land uses (either on or attached to the layout plan) giving:
  - i) the total number of erven for each land-use.
  - ii) the average erf size or range of erf sizes for each category of land-use.
  - iii) the total area of each land-use expressed as a percentage of the total land unit.
  - iv) dimensions of the proposed roads.
- (m) Existing and proposed recreational facilities.

(n) Where the subdivision of land does not apply (e.g. holiday resorts) please indicate:

- i) location and extent (in m<sup>2</sup>) of all proposed building units, and
- ii) location and extent of land set aside for other purposes e.g. public open space, parking areas etc.

# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 2

### ASSESSMENT QUESTIONNAIRE

The Assessment Questionnaire has been designed to assist developers, consultants, decision-makers and the public with the more detailed questioning and exploration of the nature and significance of impacts identified for investigation. Reference to this Questionnaire should assist with the following tasks and decisions:

- (1) undertaking impact predictions;
- (2) determining whether uncertainty exists, and whether further information and/or specialist input are required;
- (3) determining the scope of investigations required in order to respond adequately to questions asked;
- (4) identifying appropriate measures for enhancing positive impacts and mitigating negative impacts, and
- (5) determining the significance of impacts.

The questions presented in the Assessment Questionnaire correspond directly to questions asked in the Briefing Questionnaire. The questionnaire has been structured in this way to ensure a systematic investigation and assessment of all information pertinent to the evaluation process. It should also assist reviewers and decision-makers assess the adequacy of the draft and final environmental evaluation reports in terms of their accuracy and completeness of information supplied.

## SECTION I

## A. PROPOSED DEVELOPMENT PROJECT IN RELATION TO THE BIO-PHYSICAL CHARACTERISTICS OF THE SITE AND SURROUNDINGS

**Geology and Soils**

1.
  - (a) Do the topography, geology or soils of the site and surroundings present any problems with regard to the design, siting, construction and maintenance of the proposed development?
  - (b) If YES, has the developer indicated how these difficulties may be overcome, and if so, are his proposals environmentally acceptable?
  - (c) Has the developer adequately assessed if the site proposed for development possesses any unique geological or physical features which may potentially be altered by the development?
  - (d) If YES, has the developer proposed any conservation measures to maintain or enhance such features?
2. Does the development involve any excavations or earthmoving activities which may result in detrimental environmental consequences (e.g. soil erosion, unsightly scars on landscape, etc.)?
3.
  - (a) Are the sites from where materials will be extracted for construction activities environmentally suitable in terms of their location (distance from the development site), ecological status (not critically important habitats) and zone of visual influence?
  - (b) Are these materials sites located in areas which are heavily, moderately, or not at all infested by alien plants? Could transportation of materials

from these sites result in the spread of alien plants to a pristine, alien free area?

- (c) Will materials sites be rehabilitated? Are the restoration proposals feasible, that is, are they environmentally sound and economically realistic?
- 4. Where any structures will be built on steep slopes are such activities likely to result in detrimental consequences such as slumping, sliding rockfalls or erosion?
- 5. Where the gradient of any road is steeper than 1:8 are such steep slopes likely to result in environmental problems such as soil erosion, flooding or road wash-aways?

#### **Marine/Estuarine Site Characteristics**

- 6. : (a) Are there any coastal features (e.g. steep cliffs) or coastal processes (e.g. wave and tidal action) which could impose constraints on the design and siting of the proposed development?
  - (b) Is the proposed development likely to affect any intrinsically sensitive ecosystems (e.g. coastal forests), or disrupt any coastal processes (e.g. sedimentation rates and patterns) or disturb ecosystems which are inherently unstable (e.g. mobile sand dunes)?
- 7. (a) Will the proposed development involve any modifications to the shoreline, estuarine banks or river mouth which will result in adverse environmental impacts?

- (b) If Yes, what are these impacts and how significant are they? Are these modifications essential to the successful completion and viability of the development?
8. Will any proposed development activities involve:
- a) modification of dunes;
  - b) disruption of sediment movement;
  - c) disturbance of marine life, and/or
  - d) destruction of coastal vegetation which will result in detrimental environmental consequences?
9. (a) Where dredging operations will take place will such activities result in the loss of important habitats (e.g. sea bird nesting sites) or disrupt coastal processes (e.g. current and tidal action)?
- (b) Will the dredging operations severely disturb or in any way pose a danger to the existing community or holiday-makers in the area?
- (c) Will the deposition of dredge spoil, damage or destroy sensitive ecosystems (e.g. saltmarshes) or important habitats (e.g. estuarine mudflats)?
- (d) Where maintenance dredging is considered necessary are there any environmental factors (including social and economic factors) which may impose constraints on proposed maintenance activities?
10. Will development activities result in increased nutrient input and possible alteration of nutrient balances in the estuarine or coastal systems?

11. Will the proposed development activities interfere with tidal flushing of the estuary which could impair ecosystem functioning or result in aesthetic or health impacts?
12. (a) Are the prevailing surf and tidal conditions suitable and safe for swimming and other water-based recreation activities?
  - (b) If NO, what measures will be taken to address these safety considerations?

### **Water**

13. (a) Do any of the surface water features that will be modified or destroyed by the proposed development provide habitat for any rare and/or threatened species?
  - (b) Do they serve any other ecological function which may be impaired?
  - (c) What measures can be taken to prevent, avoid or minimise the damage to ecologically important surface water features?
14. Is the proposed development likely to disrupt drainage patterns in the area to such an extent that detrimental environmental consequences, such as increased flooding or reduced water supply for local communities, may result?
15. (a) Is the proposed development suitably situated in relation to groundwater resources?
  - (b) Could construction activities, or sitings of services (e.g. refuse disposal site) result in contamination of groundwater resources or reduced flow rates?

16. (a) Will the proposed development activities lead to increased runoff which would result in problems such as flooding, erosion, changes in river flow, etc.?
- (b) Where problems are anticipated or impacts have been identified, what measures (e.g. construction of retention ponds) will be taken to address anticipated problems?
17. Where changes to hydrological functioning are anticipated what measures could be implemented to minimise these negative effects?
18. (a) Where the land under consideration is subject to flooding by catchment run-off, tidal inflow or a combination of both, please indicate:
- i) Why alternative more suitable sites are not being investigated by the proponent in consultation with the local authority?
  - ii) Where (i) is not possible, what measures are being proposed to minimise the threat of floods or tidal action?
- (b) Where the proponent has suggested measures to minimize the risk of floods or tidal action, are these proposals environmentally acceptable and financially realistic?

### **Ecological Considerations**

19. (a) Are the vegetation types found on the proposed development site sufficiently represented elsewhere along the coastal zone?
- (b) Is the site under consideration severely infested by invasive alien plant species?

- (c) If NO, is the surrounding area severely infested by invasive alien plant species? Is the site under consideration likely to become severely infested by invasive alien plant species if not developed or if a programme to control the spread of invasive alien plants is not introduced?
20. Are there any stands of indigenous vegetation or specific plant communities on the development site worthy of conservation?
21. Is it likely that construction activities or other activities associated with the development (e.g. stabilization of dunes, improved vehicular access to coastal area) will lead to the introduction and infestation of invasive alien plants to the area?
22. (a) Where the area provides habitat for any threatened plants, animals or birds please indicate whether loss of these habitats further endanger the survival of such plants, animals or birds?
- (b) Have any conservation measures been proposed by the proponent to protect such ecologically important habitats?
23. (a) Will the proposed development and associated activities (e.g. recreational activities) destroy natural resources, or restrict access to areas used by local communities for food, medicine and fuel?
- (b) If YES, what measures (e.g. providing access to alternative coastal areas) can be taken to avoid or minimize negative impacts to local communities?
24. (a) To what extent will increased human pressure in the area destroy indigenous plant communities?

- (b) What measures can be taken (e.g. footbridges to beach) to minimize the threat to indigenous vegetation?
25. (a) To what extent will the development and associated structures such as new roads, fences and/or transmission lines interfere with natural migration routes of animals?
- (b) Where disturbance and interference is anticipated, what measures will be taken to minimize the interference?
  - (c) Where development and associated human activities will interfere with sites used by migrant or non-resident animal or bird species, what measures will be taken to minimize the interference?
  - (d) Will the movement of introduced domestic species (dogs and cats) be restricted if development threatens undisturbed faunal communities?
26. Will any unusual or unique natural features in the area be destabilized, destroyed or modified as a result of the proposed project? Do any of these features have special social significance?

#### **Nature and Level of Present and Future Environmental Pollution**

27. (a) To what extent will the development and associated activities lead to increased levels of environmental pollution (water, air, noise, visual, disposal of solid and liquid waste)?
- (b) What measures can be taken to counter anticipated environmental pollution?

## B. PROPOSED PROJECT IN RELATION TO LAND-USE ACTIVITIES AND SOCIO-ECONOMIC CHARACTERISTICS IN THE AREA

### Land-Use Activities

1.
  - (a) Is the proposed development compatible with the surrounding land-uses?
  - (b) Could the proposed development adversely affect the surrounding land-uses?
  - (c) What measures can be taken to avoid or minimize impacts to surrounding land-uses?
  - (d) Are there any proposals for optimizing positive effects on surrounding land-uses that will result from proceeding with the development?
2.
  - (a) Are there any people who have historical connection to the land under consideration, or who have been displaced from the area and will wish to reclaim the land or seek compensation for lost rights and access?
  - (b) If YES, what agreements have been reached between the developer, authorities and the original inhabitants of the area regarding issues such as access to the development site, allocation of adequate land in other areas acceptable to the communities, and compensation for loss of land?
  - (c) Do the agreements and proposed measures for addressing the land requirements of these communities, affect the feasibility of proceeding with development?
3.
  - (a) Will the proposed development benefit or adversely affect commercial, recreational and economic activities in nearby settlements, villages or towns?

- (b) Is the proposed development suitably located in terms of the communities it will serve?
4. Where the proposed development abuts (or is in close proximity to) an existing coastal town, township-extension or holiday resort, are these areas sufficiently developed and utilized to suggest that further development is desirable?

### **Socio-demographic Characteristics**

5. Will the anticipated increase in numbers of permanent residents and/or holiday-makers to the area in any way disrupt the existing population or holiday-makers who regularly visit the area?
6. To what extent can the resources, facilities and social services of the area accommodate the anticipated increase in numbers of permanent residents and holiday-makers to the area?

### **Local and Regional Economy?**

7. Is the development project compatible with the economic base of the area?
8. (a) Is it likely that the proposed development will generate other development opportunities (e.g. eco-tourism, boat-yards, shopping centres) in the area?
- (b) If YES, are the kinds of development envisaged compatible with the environmental characteristics and conditions in the area?
9. (a) Will the local authority benefit from the proposed development or will it be a financial burden to them?

- (b) Where the local authority is responsible for the maintenance of services and/or facilities, does it have the financial and human resources to meet these responsibilities?
10. Will the location of this holiday township/resort have a positive or detrimental effect on any commercial or business enterprises in the area or the local and regional economy in general?

### **Employment Characteristics**

11. (a) Will the projected employee requirements for this project result in any social problems in the area?
- (b) If social problems are anticipated, what measures will be taken to avoid or minimize these problems?
12. (a) Will the proposed development provide employment opportunities for local people during the construction phase of the project?
- (b) If not, are the reasons given for not using local labour satisfactory?
  - (c) Will an influx of non-local labour to the area result in any social or health problems?
13. (a) If temporary housing and facilities are provided for the workforce, is the site chosen environmentally suitable and socially and aesthetically acceptable?
- (b) Is the quality of the accommodation and facilities to be provided of an acceptable standard?

- (c) Are the proposals for removing the facilities and restoring the site satisfactory?
14. (a) If non-local labour remain in area after construction is complete, are any problems envisaged?
- (b) If YES, what measures will be taken to minimize these problems?
15. Will the implementation of the development in any way contribute to alleviating unemployment and poverty in the area?

### **Community Cohesion, Values and Lifestyles**

16. (a) Where identifiable groups in the community, such as disadvantaged or minority groups, will be negatively affected by the development, what measures will be taken to avoid or minimize the impacts?
- (b): Are the proposed measures acceptable to all groups?
17. Where the development will result in community disruption or severance, what measures will be taken to minimize these negative effects?
18. (a) Where traditional lifestyles may be detrimentally affected by the proposal, what measures will be implemented to avoid or minimize these negative affects?
- (b) Are the proposed mitigatory measures acceptable to the affected communities?
19. (a) Will the proposed development create expectations amongst the local communities which cannot be fulfilled?

- (b) What steps will be taken to adequately inform communities of the likely impacts and opportunities arising from the development proposal?

### **Recreational Patterns of Use and Facilities**

20. (a) Can current patterns and levels of recreational use be accommodated and sustained without imposing risks to recreation users, without impairing the ecological functioning and health of the coastal system and without adversely affecting the enjoyment of the recreational experience?
- (b) If the answer to any of the above questions is NO, what measures have been proposed or will be implemented to address these constraints?
21. (a) Are the proposed recreational facilities suitably located in terms of the general layout of the proposed development (and adjacent developments where they exist)?
- (b) Are the type of recreational facilities proposed suitable in the context of the proposed development?
- (c) Are the design and scale of the proposed recreational facilities compatible with the local landscape?
- (d) Will the proposed recreational facilities result in modifications to the land or shore which may have detrimental ecological consequences (e.g. bank erosion)?
- (e) Are the proposals concerning the maintenance of the facilities satisfactory?

22. Has the developer indicated who will have access to recreational facilities?
- a) Where access to facilities is intended to be limited, is this the most environmentally and socially desirable option?
  - b) Where access to facilities is unrestricted (open to the public) is there a possibility that over-utilization (with consequent degradation of the resources) and/or overcrowding may result?
  - c) What control measures could be introduced to prevent further overcrowding and degradation of resources?
23. Will the environmental resources and existing recreational facilities be able to accommodate the projected increase in people to the area in such a way so as not to pose a safety risk to recreation users, impair or degrade recreational resources, or adversely affect the quality of the recreational experience being sought?

### **Transport Networks**

24. (a) Are the access roads to the site of an acceptable standard and able to carry the anticipated volume of traffic?
- (b) Where access to the site must be provided, is the proposed road alignment likely to result in detrimental environmental consequences (e.g. soil erosion, loss of ecologically important habitats, etc.)?
- (c) Have the relevant authorities been consulted?
- (d) Are the arrangements with regard to the building, financing and maintenance of the road satisfactory?

25. Is the existing road network in the area able to cope with the additional traffic without causing unacceptable levels of congestion or constituting a danger to other road users?
26. Where improvements to road networks will be undertaken, have the environmental impacts of such proposals been fully evaluated?
27. Where parking facilities will be provided, are the sites selected suitable in terms of environmental and aesthetic considerations and convenience to the user? If parking facilities will not be provided, will existing facilities be adequate to meet demand?

#### C. PROPOSED PROJECT IN RELATION TO CULTURAL AND HISTORICAL RESOURCES

1. (a) Are there any sites or resources of archaeological, historical or cultural (including spiritual or religious) value which will be disturbed, degraded or altered by the proposed development?
- (b) Where such sites or resources are protected by the National Monuments Act 28 of 1969, and will be destroyed, damaged, excavated or altered, has the developer obtained a permit to proceed with proposed activities?
- (c) What measures can be taken to avoid or minimize disturbance and degradation of these sites and resources?
- (d) What measures will be taken to avoid or minimize loss of, or reduced access to, and use of such sites and resources?

## D. LANDSCAPE CHARACTER

1. Is the proposed development compatible with existing developments in the area in terms of its location, general layout, scale and density?
2. (a) Is the proposed development architecturally compatible with other developments in the area and does it suit the local landscape character?  
  
(b) Are materials to be used similar to those used in existing developments and/or those of the local area?
3. (a) Has the applicant suggested any measures to prevent speculative buying and encourage building development? Are these suggestions realistic and will they be acceptable to prospective property owners?  
  
(b) Where no restrictions are imposed on building styles or materials used, could such individualistic (*ad hoc*) development by private owners alter or even destroy the landscape character of the area?
4. (a) Will the proposed development substantially alter scenic views and vistas for local residents, neighbouring communities, road users, etc.?  
  
(b) Will the proposed development alter or destroy the landscape quality or character of the area which initially attracted development?  
  
(c) Are the landscaping proposals environmentally and visually acceptable?

## E. INFRASTRUCTURAL SERVICES FOR THE PROPOSED DEVELOPMENT

### **Domestic Water Supply**

1. (a) Will the proposed source of domestic water supply meet the anticipated demand, especially during peak holiday periods?
- (b) Where boreholes will supply water, is the quality of the water of an acceptable standard?
- (c) Where a storage dam or other structure is required, will such structures have any detrimental consequences or visual impacts?

### **Sewage Disposal**

2. (a) Is the proposed method of sewage disposal adequate to cope with the anticipated demand and is it environmentally acceptable?
- (b) Where a septic tank system is proposed, are there any environmental characteristics (e.g. soil type, fluctuating water table) which may impose constraints on successful functioning of the system? Is there any risk that seepage from septic tanks may pollute groundwater resources?
- (c) Where the laying of new pipelines is required, are such activities likely to have any detrimental effects on the environment?

### **Source of Electricity**

3. (a) Will the proposed site and development project be powered by electricity?

- (b) Will the supply of electricity to the proposed township or resort result in the development of an infrastructure which may have significant environmental effects?
- (c) Where the building of a substation is required, will the siting and design of such structures result in any detrimental environmental or visual impacts?
- (d) Where the proposed development will lead to the provision of electricity to an area previously not supplied with electricity, is the existing community in favour of the provision of such services?

#### **Refuse Collection and Disposal**

- 4. (a) Is the proposed method of refuse collection and disposal acceptable? Could the location of the refuse disposal site present a health risk to local communities, result in pollution of groundwater resources or result in the spread of unsightly litter?
- (b) Will the collection of refuse during peak holiday seasons be regular and efficient?

#### **Stormwater Drainage and Discharge**

- 5. Is the proposed stormwater drainage system and point(s) of discharge environmentally acceptable?

#### **Linkage to Telecommunications Network**

- 6. (a) Will the proposed development be linked to telecommunication networks? If NO, could the lack of such services discourage people from buying property or holidaying in the area?

- (b) If YES, could this result in any new structures such as telecommunication lines or towers in the area which may interfere with scenic views, bird flight paths, etc.?

### **Emergency Services**

- 7. (a) Are emergency services (such as ambulance and fire fighting services) available, and adequate to handle increased demands associated with the proposed development?
- (b) If NO, has the developer made private provision for such services or notified the local authority of the need to increase the capacity of governmental emergency services in the area?

## **F. HEALTH, SAFETY AND RISK CONSIDERATIONS**

- 1. : Where the proposed development will result in increased dust, noise, traffic or other nuisances, what measures will be implemented to avoid or minimize these affects? Will the proposed measures reduce these disturbances to acceptable levels?
- 2. (a) Where the development is located in a high risk area, what measures will be taken to minimize risk to property and life?
  - (b) Are the proposed mitigatory measures financially realistic and environmentally sound?
- 3. Where the siting of the proposed development may pose a risk to surrounding properties, what measures will be taken to minimize the risk to these properties? Are these measures environmentally acceptable?

## G. CUMULATIVE AND SYNERGISTIC EFFECTS

1. Where cumulative and synergistic effects are anticipated, what measures will be taken to minimize such effects?
2. Could the proposed development be constrained by the anticipated cumulative and/or negative synergistic effects?

## H. PUBLIC INVOLVEMENT

1. Have the public been adequately informed and involved in the various tasks and processes of the Coastal Environmental Evaluation Procedure?
2. (a) Where legislation required that the proposal be advertised for comment, were such advertisements placed and was adequate and accurate information supplied to the public to enable them to comment from an informed position?  
  
(b) Were the plans and information regarding the proposed development accessible to interested and affected parties for a reasonable period of time?
3. Were the procedures for public review of the Draft Environmental Evaluation Report adequate and was sufficient time given for the public to submit comments?
4. (a) Have the comments made by the public been adequately addressed?  
  
(b) Have all the objections and concerns been noted and incorporated into a revised proposal and the Final Environmental Evaluation Report?

## SECTION II

- 1-3 Has all the information requested been accurately and completely supplied?
4. Does the title deed of the property contain any servitudes or restrictive conditions which may impose constraints on the proposed development or restrict the activities of people utilising the area?
5. Has the developer adequately demonstrated that there exists a need for a development of this nature in this area?
6. Have the directly affected local authorities been notified of the proposed development and have they been adequately involved in the development and assessment of the proposal?
7. (a) Are there likely to be any technical, legal or other problems should any required rezoning be approved, (e.g. reduce land values of adjacent properties) or refused (e.g. where use rights under a rezoning have been partially exercised and the rezoning has lapsed)?  
(b) Is the proposed zoning compatible with zonings in the immediate vicinity of the development site?
8. (a) Does the proposed development comply with the guidelines for future spatial development of the area as set out in the structure plan (where such a plan exists or is in preparation)?  
(b) If NO, have circumstances and conditions in the area changed in any way to suggest that a proposal of this nature would be favourably considered by the relevant authorities and local communities.

9. (a) Where a guide plan exists for the area under consideration, does the proposed development comply with the forward planning and development guidelines and goals set out in the guide plan?
- (b) If NO, has the developer provided adequate information and motivation to support this proposed deviation from the guide plan? Has the proponent indicated how the proposed land-use would be of greater benefit to society than the proposals put forward in the guide plan?
10. Has the necessary approval been received from the relevant authorities? Where approval has been refused, could the concerns and problems identified by a particular department be overcome by:
- a) modifying the proposed project,
- b) adopting mitigating measures, and/or
- c) : undertaking further investigation to clarify uncertainties.
11. Where the applicant owns land in the immediate vicinity of the proposed development site, do his plans for future use of this land complement the current proposal and make it a more desirable proposal?

# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 3

### GUIDELINES FOR INVOLVING AUTHORITIES AND INTERESTED AND AFFECTED PARTIES THROUGHOUT THE CEEP

#### INTRODUCTION

This guideline document provides information and ideas regarding the way in which authorities and interested and affected parties (I&AP'S) can be effectively involved in the scoping and public participation process of the proposed CEEP. It provides guidance on:

- methods of identifying and notifying I&AP's and factors to consider in initiating contact with such groups,
- how I&AP's may be informed of a proposal (including policies, programmes, plans and projects) and of an intention to initiate and implement a public participation programme, and
- methods and techniques for involving the public at various stages of planning, evaluation and decision-making.

The level of public involvement can range from: the dissemination of public information, where the goal is to inform the public about a proposal; inviting the public to provide information and express concerns before a decision is made; to more encompassing approaches, where the public can influence a decision directly or undertake decisions jointly with the responsible decision-making authority or be empowered to make the final decision.

There is clearly no one method or technique that is adequate and effective for the variety of tasks and processes characterising the CEEP. Table 1 provides a summary of the most widely used methods and techniques of public participation,



Table 2: Evaluation Criteria for Table 1

Audience Size	Small 1-15; Medium 16-50; Large 51 +;
Expertise Required	Skills required by the proponent/consultant to facilitate participation - such as facilitation and group interaction skills, questionnaire design experience etc.;
Resources Required	Resources such as time, person power and funds required to achieve participation objectives;
Information Exchange	The potential for information exchange and public input into the various stages of proposal planning, assessment and implementation;
Education Potential	The potential to raise the level of awareness and understanding of issues, impacts and concerns, amongst all participants;
Issue Identification	Potential to identify contentious and significant issues associated with the proposal;
Problem Solving Value	The potential to resolve problems and assist in the resolution of outstanding issues;
Performance with Diverse groups	Ability for information exchange where diverse communities are involved;
Performance with Disadvantaged Groups	Ability to involve representative members from disadvantaged communities;
Facilitates Empowerment	Potential to develop a sense of responsibility, self-reliance and empowerment.

as well as an indication of the utility and effectiveness of these methods in terms of certain evaluation criteria. These evaluation criteria are presented in Table 2.

The choice of methods used would be guided by a variety of factors such as education levels of the affected parties, as well as an evaluation of the capability of the method to perform the tasks set for it. This guideline document provides information on the strengths and limitations of the various methods, as well as guidelines for implementation.

## IDENTIFICATION AND NOTIFICATION OF AUTHORITIES AND INTERESTED AND AFFECTED PARTIES

### **Contacting of Authorities**

The responsible decision-making authority, as well as other relevant authorities with responsibilities, interests or special expertise relevant to the proposal, should be directly contacted for information and comments. It is likely that consultations with these authorities would have already taken place during the initial planning stages of CEEP which are concerned with defining the need and developing the proposal. Consultation with authorities will usually take the form of informal discussions or small working groups. These discussions should be directed at identifying any legal or administrative constraints that may exist, exchanging information on the proposal and its likely impacts, as well as determining the major concerns of the various authorities whose interests may be affected by the proposal.

### **Contacting I&AP's**

Established lists and the process of networking are probably the most effective methods of initiating contact with interested and affected parties. However, for certain proposals there is no clearly definable public, especially for projects or plans which may have regional or national implications. In these instances, notifying the public through advertisements in the press or other media may be the most

appropriate approach. In particular, the method of notifying disadvantaged communities of proposals and opportunities to participate in public involvement programmes needs special consideration. This is addressed elsewhere in the guideline document.

### **Established Lists**

Established lists and directories are useful sources for identifying interested and affected parties. These include commercial lists, municipal records of ratepayers and property owners, as well as lists of members belonging to specific interest groups or professional organisations. Local authorities should be encouraged to develop and maintain mailing lists of individuals and organisations who are likely to be interested in or be affected by development proposals in their area of jurisdiction. Random or stratified sampling methods provide a reliable way of selecting samples from these lists that will be representative.

### **Networking**

Networking is the process of identifying interested and affected parties through a chain referral system. The consultant's first task is to establish key individuals who should be consulted. This may be done by examining maps and directories relevant to the area, or by asking the known key players (e.g. local authorities, adjacent property owners and civic leaders), for the names of individuals, institutions and groups who may have an interest in, or would be affected by, the proposal. These individuals are contacted and further names of potentially interested and/or affected persons/parties are requested. This process is continued until the consultant is confident that all interested and affected parties (or at least representatives of such groups) have been invited to participate in the process. A general checklist of the categories of interested and affected parties that should be considered in most scoping and public involvement exercises is given in Table 3.

### Announcements in Publications/The Media/Public Places

The public may be informed of the proposed activities and the plan to undertake an EIA through several mediums:

- the press and other popular publications;
- TV and radio;
- government gazette;
- brochure/pamphlet or fact sheet;
- exhibitions/displays;
- newsletters;
- direct mail, and
- public notices.

**TABLE 3: GENERAL CHECKLIST OF CATEGORIES OF INTERESTED AND AFFECTED PARTIES TO BE CONSULTED IN ANY SCOPING AND PUBLIC INVOLVEMENT PROCESS**

<p>State departments with relevant statutory or administrative responsibilities</p> <p>Other state departments whose policies, programmes or plans may be affected</p> <p>Other political groups</p> <p>Provincial authorities</p> <p>Regional authorities</p> <p>Local authorities</p> <p>Contiguous property owners</p> <p>Owners of property or interests likely to be affected</p> <p>Non-governmental organisations</p> <p>Community organisations</p> <p>Community service groups</p> <p>Business interest groups</p> <p>Trade unions</p> <p>Environmental interest groups</p> <p>Education organisations (both formal and informal)</p> <p>Other coastal interest groups (e.g. fishing and boating clubs)</p>
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Announcements would briefly describe the proposal, inform the public of an intention to undertake an environmental evaluation, that a process is being initiated to determine an appropriate public involvement programme and how I&AP's can inform and participate in that process. The kind of information required would be background information on the proposal and/or where it could be obtained (e.g. library), an invitation to submit written comments, contact the consultant, or attend a meeting.

### **Notifying and Involving Disadvantaged Communities**

Special attention should be given to the methods employed to notify disadvantaged communities. In the South African context, disadvantaged communities are those communities which have historically been denied access to resources and adequate opportunities for educational, social and economic development, as well as those excluded from the political process.

Possible ways of notifying these communities include:

- : employing traditional methods of community participation where they exist and are still acceptable to the community. (Consultants/researchers will have to work through community leaders and representative groups within the community);
- appointing a locally-based organisation or credible service organisation familiar with and acceptable to the community, to inform them of the proposal and to conduct meetings, workshops or interviews to ascertain the most appropriate form of community involvement;
- displaying a simple and well-illustrated fact sheet of the proposal in prominent places (e.g. a notice board in the community centre) and inviting interested persons to meet with the proponent at a fixed time to discuss what form community involvement should take; and,
- identifying key players, social groups or committees within the communities through informal discussions and inviting them to participate in the process.

Other factors which need to be considered when exploring what methods to use to notify disadvantaged communities include literacy levels, language medium, level of organisational structure within the community, social biases (e.g. absent migrant workers), cultural biases (e.g. male dominance) and so on.

## FACTORS INFLUENCING PARTICIPATION APPROACH EMPLOYED

There are a variety of methods for obtaining the views and insights of interested and affected parties. In determining the appropriate approach for participation, the consultant, authority or advisory group should take the following into consideration:

- the location of the project in relation to interested and affected parties;
- the number of people likely to be involved;
- the resources available (time, funds, manpower);
- the level of training of personnel involved;
- the level of education of parties to be consulted;
- the socio-economic status of affected communities;
- the level of organisation within the community;
- the degree of homogeneity of public involved;
- the confidentiality or strategic importance of the proposal, and
- history of any previous conflict or lack of consultation.

Whatever programme of public involvement is selected it should be designed to suit the circumstances. The importance of using a combination of participation techniques in the process must be emphasised. Different techniques would be more appropriate at different stages of the assessment process. For example, an initial exhibition to inform the public of a proposal may be followed by a public meeting. Thereafter it may be appropriate to undertake face-to-face interviews or a series of workshops to gain more in depth information.

## PUBLIC PARTICIPATION TECHNIQUES

### **Newspaper Advertisements/Mass Media Announcements**

Advertisements in newspapers and public media can be used to provide information to the general public on a proposal and at the same time solicit comment from them. They can also be used for announcing public meetings or other public involvement activities. A public announcement using the mass media (e.g. press, television, radio) requires considerable planning, as it can significantly enhance any public participation exercise or harm it seriously. The effective use of the press and other media will require the availability of substantive information regarding the proposed development, with an understanding of the needs of the broadcast and print journalism industry.

An advertisement in the press could also include a response form on which readers can express their opinions or indicate a willingness to participate in other public involvement activities. Most newspapers are able to handle the distribution of inserts for a modest cost per copy since this is a common method of advertising. Newspapers may print the insert at less cost than commercial printers.

The way in which an advertisement is placed will obviously affect the number of people who are reached. A prominent advertisement placed in the body of a newspaper with maps or photographs is much more likely to be read than one placed in the classified advertisement section of the newspaper.

### *Limitations*

A major limitation of this method of participation is that the information will only reach those interested and affected parties that regularly purchase and read the newspaper, or who have access to media channels (television and radio). This would obviously exclude members of the community who are poor, illiterate, or speak a different language. A further limitation of newspaper advertisements is that

the reporting may be superficial especially at the community newspaper level. Furthermore, in the case of a newspaper article, the editor usually makes the final decision on what is written. The total costs of the advertisement can be high because of the large number of copies involved. The response rate of people commenting on a proposal or returning a response form is low, and cannot be represented as statistically valid.

### *Guidelines*

It is important to place the advertisement or article in a prominent place in the newspaper, so as to be read by a large number of people. The information provided should be accurate clear and concise and the language should be simple and without technical jargon. The advertisement should indicate how further information about the proposal and the public involvement programme can be obtained. Because of the limitations of newspaper advertisements this method of public participation should only be used as a back-up to other methods.

The following are important points to consider when using mass media channels:

- personal contact with reporters is vital for accurate and effective reporting of the intent of the proponent and consultants;
- clearly identify those issues that need to be presented through the mass media;
- recognise, and allow for, the time constraints of the news industry in meeting project deadlines, and
- prepare comments/public responses to the press with the appropriate amount of thought i.e. avoid "off-the-cuff" responses.

### **Exhibits/Displays**

Exhibits or displays can be used to inform the broad public of a proposal, or public involvement programme, or to obtain comment, thus forming an important information function. Such displays enable information to be accessed by a large

number of people at their own pace, in an attractive and graphic form. They are usually set up in busy public places such as the post office or shopping centres where they can attract the attention of the general public. This technique usually takes one of two forms:

- fixed displays which give general information, or
- booths manned by public involvement specialists who give information, answer questions and solicit comment.

Exhibits and displays can be extremely effective in helping people visualise the proposed project or plan. Aids such as physical models and drawings should be meticulously prepared otherwise they could give a distorted view. The use of videos and narrated slide-shows can be very useful, especially where illiteracy is a problem. Exhibits may be particularly useful in reaching individuals that had not previously been interested in the proposal, so were unlikely to participate in public involvement activities.

### *Limitations*

Exhibits or booths that are staffed require a major commitment of staff time. Since this method of public involvement will obviously not reach all interested and affected parties it must be co-ordinated with other public involvement techniques. This will ensure that interest developed through the exhibit can be directed into other public involvement activities.

### *Guidelines*

Exhibits and displays should be well advertised and set up in busy public places. Displays should be informative and simply constructed. They may include site plans, maps, photos, physical models, videos or charts on various stages of the study. Any written information should be translated into the languages used by the major groups identified as interested and affected parties. The information should be in simple language, without jargon, technical and scientific terms so that it can be easily

understood by the general public. The display should clearly indicate whom to contact for further information and how the public may participate in other public involvement activities.

### **Written Information**

Some form of written information including information bulletins, reports, brochures, flyers or newsletters is usually incorporated into any public involvement programme. These methods are essential vehicles for informing the different publics of opportunities for participation, the progress of the study to date and any decisions that have been made.

Information bulletins or newsletters are periodic reports to the public published as a means of maintaining a continuing interest in the study, as well as documenting the progress in the study in a highly visible manner for the public. Such written information is particularly important during periods of the study which are relatively technical in nature. During these periods, the public are informed of what is occurring through these media.

Brochures are usually brief (up to 16 pages) and contain a description of the study, the issues involved in the study, and a summary of the opportunities for the public to participate in the study. Typically, brochures are used to inform new interested and affected parties of the initiation of the study.

Reports usually form a part of any public involvement programme. They may be used initially to inform the public of the proposal, of alternatives under consideration and of the issues that have been identified thus far. Draft EIA's are also frequently made available to the public for comment.

Because reports contain technical information, one key requirement is to write reports in a manner which provides needed technical information, but are accessible and understandable to the general public. It is sometimes useful to have reports

reviewed by an advisory committee who can point out confusing, biased, or unnecessary material in the report. Reports should be placed in public places (e.g. library) and sufficient time must be given for the public to scrutinise the document.

### *Limitations*

Preparation of attractive publications requires skills which are not available in all organisations, and which may have to be purchased outside the organisation. Because of cost factors, publications still reach only a limited audience and cannot be considered the only means by which to inform and involve the general public.

The public will only read reports if they are easy to understand and attractive. Preparation of simple, non-technical and attractive reports can be a time consuming and expensive task. Allowing sufficient time for the public to read a report places time constraints on the assessment process.

### *Guidelines*

Use simple language and ensure that the publications are available in all languages spoken by the involved public. Where possible, use graphics and diagrams for explanation or to create interest. Provide clear information on how the public may participate in other aspects of the public involvement programme. Ensure that the documents reach, or are easily accessible to, all interested and affected parties.

### **Phone Lines**

A phone-line or hotline is a telephone number which is publicised through repetition in brochures, reports, news stories and advertising, so that citizens can call to ask questions or make comments about proposals or issues.

The phone-line helps the public locate those people who have the information they need, or to whom they should be speaking regarding specific issues relevant to the

proposal. It can also provide a convenient mechanism for receiving public comments. Furthermore it is unthreatening for those who don't find it easy to participate or speak out. It thus provides a convenient means by which citizens can become involved in an EIA.

A phone-line can be a useful mechanism for the co-ordination of public involvement activities, since it provides a single source of information about the time, date and place of various public involvement activities.

### *Limitations*

Communication using a phone-line is not as effective as face-to-face discussions since the information may not be readily available; certain people may feel inhibited, and reference to materials for explanation or clarification cannot be used. Another limitation is that it is in no way representative; one cannot assume that a non-respondent is not interested. A further problem is that many South Africans do not have a telephone. Staff must be prepared to provide information requested by the public promptly. This can affect other work priorities.

### *Guidelines*

The phone-line should be established so that the call is toll free to the public regardless of where the call is placed. It should be operated by friendly staff with good communication skills who will take responsibility for finding answers to questions or for relaying queries, comments or objectives from the public to appropriate personnel. A phone-line requires a firm commitment in terms of staffing, as the ability of staff to answer questions effectively may be compromised if they are expected to do other work as well.

## **Open House**

An open house is a participation method which encourages people to drop in during announced hours to discuss a proposal with the proponents and their consultants. The primary purpose of open houses is to educate the public regarding the proposal or study. Displays and exhibits can also be set up to facilitate the process of giving information and responding to questions. An open house must be held at an accessible location and at times of day which allow everybody to participate. Due to the informality of the event there is an opportunity for direct interaction between the people involved in a particular project and the public. It provides a chance for misconceptions to be corrected and for the different publics to get their points over in depth. With open houses it is often possible for more members of the public to be spoken to directly than at events such as public meetings.

### *Limitations*

Open houses are primarily a vehicle for informing the public rather than obtaining information from them. To be effective, Open Houses must be well-publicised and information displays and handouts must be prepared. This requires considerable preparation, cost and staff time.

### *Guidelines*

The Open House should be located at a valued community facility (e.g. a library hall or community centre) and should be accessible to all sectors of the community at convenient times. Staff should be well-informed of the proposal, alternatives and issues, and should be able to communicate this information effectively to the broad public. Information displays and handouts should be attractively prepared and the language used should be simple and clear.

## **Field Office/Site Visit**

*Field Office:* A field office is typically located on the site proposed for the development project, or in a focal place within the local community which will be impacted by the development. It can either consist of a mobile caravan or trailer, or an office in a storefront or shopping centre. As decision makers are often physically isolated from the people who will be impacted by the development, the purpose of the field office is to facilitate the informal interaction between decision makers and the local community through "drop-in" visits. The field office also provides a place of information transfer to the affected community.

*Site visits:* Site visits allow interested and affected parties to visualise and comprehend a proposed development, and the anticipated benefits or problems of the project. The project will become real for the participants, and the experience can build credibility for the proponent. Field trips should augment public meetings, rather than replace them.

### *Limitations*

A field office can be expensive to operate. This cost may not be justified as the local residents might not use the field office sufficiently. Also, if all the communities involved do not have field offices, there might be a feeling of injustice and slighting which could make the credibility of consultation harder.

### *Guidelines*

The field office should be staffed by people working on the project who are informed regarding the project and who will interact with the impacted community. The field office should be designed for transfer of information to the local community, and if large enough, should be a place for meetings, workshops, open houses, and exhibits.

Site visits should be conducted by well informed guides, preferably senior staff. The guide should be well briefed on the group, their needs and questions which may be raised. Participants should be provided with background information prior to the field visit. All questions should be answered in the field, fully and clearly, and with authority.

### **Public Meetings**

A public meeting is a gathering of interested and affected parties to present and exchange information and views on a proposal. There are several functions which meetings serve. These functions may be fulfilled in different meetings or several functions may be fulfilled in a single meeting. These functions include:

- to provide background information on the proposal;
- to identify other interested and affected parties and constituencies;
- to respond to any questions or concerns regarding the proposals;
- to actively seek information which could include perceptions of needs, attitudes to specific aspects of the proposals, and issues of concern;
- : to identify reasonable alternatives and/or significant issues associated with the proposal;
- to provide feedback to the public (e.g. progress of investigations, completion of the draft EIA), and
- to seek consensus on problems, opposing views and conflict areas.

While public meetings appear to be the simplest and most direct way of gaining contact with the public, they are one of the most complex, unpredictable and demanding methods of public involvement and suffer from several limitations.

### *Limitations*

Large public meetings may create an intimidating atmosphere and prohibit people from raising questions or concerns. Meetings can be taken over by interest groups or assertive/vocal individuals who have a particular agenda. People also use public

meetings to raise and discuss other issues beyond the scope of the proposal. On a practical level it is also difficult to know how many people will participate and therefore what facilities and services will be required. A public meeting does not ensure that all views are heard, not only because most people do not participate and so do not make their feelings known, but also because only those people with time available can participate.

### *Guidelines*

In designing a meeting it is important to be clear about what you wish to accomplish by holding the meeting. The function of the meeting, as well as the anticipated audience size, will also influence the meeting format. The most commonly used formats are:

- briefing, followed by questions and answers;
- briefing, discussion periods, small group format, report-back to meeting;
- panel discussion, questions and answers, followed by issue/alternative identification;
- presentation of proposals, issues and alternatives, working groups identify additional issues/alternatives, and
- report-back followed by questions and additional concerns.

The meeting should begin with a description of the proposal and its anticipated effects by the proponent or his/her consultant. Displays of posters and other illustrative material may also be made available to give the public a good understanding of all aspects of the proposal or proposed actions.

Concerned people should then be invited to identify the issues and/or alternatives that they believe should be addressed in the EIA. To run such a meeting successfully, a facilitator must first explain the "ground rules" of such a meeting - these are of crucial importance, as are his/her skills in tactfully enforcing these rules. It is recommended that the following two conditions are placed on those who ask questions or raise concerns:

- speakers are limited to a brief and specified period of time, and
- speakers must restrict their comments to the identification of major issues and/or possible alternatives to the proposed action, and not use the platform to make a speech or an emotional appeal.

A written or taped account should be made of the proceedings. When all persons who wish to give their views have spoken, then the facilitator should explain how their suggestions will guide the assessment process. It should also be explained how interested parties can make further contributions, such as providing comments on a draft environmental report. Meetings should be held at a time and place convenient to the public.

### **Surveys, Interviews and Questionnaires**

Surveys in the form of face-to-face interviews, self-administered questionnaires or telephone surveys can be used to determine public attitudes, values and perceptions on the various issues surrounding a proposal. There are three basic survey methods:

- self-administered questionnaires;
- personal interviews, and
- telephonic surveys.

Different response rates and costs can be expected from each method (see Table 4).

**TABLE 4: RESPONSE RATES AND COSTS OF VARIOUS SOCIAL SURVEY METHODS**

<b>Method</b>	<b>Projected Results</b>	<b>Cost</b>
Self-administered Questionnaire	Low % returns	least expensive
Telephone Interview	Some sampling inadequacies	medium costs
Personal Interviewing	High response	high

The advantages of a self-administered questionnaire over an interview survey are economy, speed, lack of interviewer bias, and the possibility of anonymity and privacy to encourage more candid responses on sensitive issues.

The advantages of an interview survey over a self-administered questionnaire are fewer incomplete questionnaires and fewer misunderstood questions, generally higher response rates, and greater flexibility in terms of sampling and special observations.

A rigorous methodology must be employed to ensure that the findings of the surveys represent the sentiments of the communities being sampled. Surveys must therefore be designed and conducted by somebody who is experienced in survey design.

The purpose of the survey must be clear and an indication of how the information will be used once it has been obtained must be given. Surveys can provide an expression of the feeling from the "total" public, not just those individuals which are most directly affected. They can therefore give an indication of how representative the people participating in the public involvement programme are of the public at large. They also gather opinions from people who might be unwilling to speak out at public meetings or participate in other public involvement activities. Surveys also give a snapshot picture of public opinion at a given time. These opinions may change rapidly, particularly if the public starts out largely uninformed about a particular proposal. If it is not necessary to know the exact proportion of viewpoints in a community, it might be better to conduct a series of informal interviews.

When employing survey methods, it is not usually necessary to survey the opinions of all interested and affected parties. Probability sampling methods (in particular random and stratified sampling) provide a reliable way of selecting samples that will be quite representative within known degrees of confidence.

### *Limitations*

Designing and administering a questionnaire requires skill, is expensive and a time-consuming task. Questionnaires convey public views at a given time. Increasing awareness of the issues associated with a proposal through new information or other public involvement activities may modify these views. The cost of analysing large numbers of responses to surveys is high.

The main limitation with self-administered questionnaires is that the response rate is usually low unless the researcher delivers and/or collects the questionnaires.

The main limitation with face-to-face interviews is that they are time-consuming and it is possible to interview only a limited number of people. The possibility of interviewer bias and lack of anonymity of respondents are further weaknesses of this method.

The major constraint associated with telephone surveys is that a significant portion of the population does not have telephones.

### *Guidelines*

The first step in conducting any survey is to clarify the purpose of the survey and to convey this to the interviewees. Those selected for the survey should also be informed about how the information will be used (including its confidentiality), who or what kinds of people are being interviewed and how long the survey will take to complete. It is essential that interviewers are neutral so that their presence in the data-collection process does not bias the results. Interviewers must be carefully trained to be familiar with the questionnaire, to follow the question wording and order exactly (except where probing is considered appropriate) and to record responses exactly as they are given.

Recognised sampling methods which are acceptable to interested and affected parties should be followed to ensure that all representative groups have been included. The length of the interview or questionnaire should be as short as possible but should not exceed 60 minutes. There are several references on how to design questionnaires, including types of questions, layout of questionnaires, sampling methods and so on.

### **Delphi/Nominal Group Technique**

*Delphi Technique:* The "Delphi Technique" is a procedure for obtaining group viewpoints on questions which are either shrouded in uncertainty, such as those concerned with forecasting the future, or which are directed at eliciting subjective value judgements. The object of the technique is to seek the insights of generally knowledgeable and respected persons, and use their judgments as systematically as possible. The principal features of the Delphi technique are anonymous debate, controlled feedback, and statistical group response. The actual procedures used in applying the technique can vary, but all variations of the technique involve an iterative process designed to clarify thinking on the subject and move the group toward consensus.

The technique can be conducted through the post, in which case total anonymity can be preserved, but time requirements are then high and participants may lose interest. Alternatively, the assessment can be completed in a single session and complete anonymity preserved by using computer facilities with remote terminals; unfortunately, computers are expensive and not always accessible. Since Delphi is a fairly sophisticated technique, its use is limited to experts, professionals and generally knowledgeable people.

*Nominal Group Technique:* The "Nominal Group Technique" (NGT) is a technique to assist groups to generate and prioritize a large number of issues. It is a structured group meeting in which individuals work in the presence of others but do not verbally interact for a period of time. The technique is based on the fact that small groups

in which participants do not interact are the best for idea generation, and small groups which do interact are the best for idea evaluation. The NGT therefore allows periods for interacting and not interacting in a controlled sequence.

The NGT identifies concerns with minimal "bandwagon" effects and domination by vocal individuals. It also generates a large number of ideas and has a built in evaluative capability. It is adaptable to a variety of weighting, voting and rating techniques and builds consensus in the issues which are important. One drawback to the NGT is that it is a very structured activity and people who come to a meeting to express their feelings and particularity to win others over to their point of view, may feel restricted and resentful of the structure. Some people may feel "processed" rather than consulted.

### *Limitations*

These techniques can produce a homogeneous point of view. The process of mailing questionnaires in the Delphi Technique and the numerous iterations in both techniques can be time consuming and cumbersome. The Delphi Technique does not allow for direct interaction between the participants, which can be disadvantageous if the agency is not trusted. This is a disadvantage that the NGT addresses. The public may be no more willing to accept the results of the Delphi Technique or NTG than they were to accept the opinion of the agency.

### *Guidelines*

When employing the Delphi Technique, an open ended, unstructured questionnaire needs to be prepared related to the participants' forecasts concerning the topic. A competent, acceptable and accountable person needs to be selected to act as the director who conveys the information about the forecasts to the participants. S/he would need methods of communicating the information from each iteration to the participants (e.g. overheads, photocopies of the results).

An acceptable weighting and scaling of the probability of the forecasts occurring needs to be established. Statisticians need to summarise the participants results during the iterations and then provide a final statistical summary of the estimated forecasts.

The participants need to be committed to the process of numerous iterations until a final statistical summary is made. The participants should be committed to not communicating with each other during the process, as this can influence their opinions. The only time interaction should occur is when participants explain why their responses differ from the norm. This is however only done in writing and not orally.

### **Workshops/Small Group Discussions**

The term "Workshop" is used for a wide variety of small meetings in which a limited number of participants can be briefed on a proposal and be engaged in: the review of information; the detailed definition of issues; problem solving, and the review of plans. Workshops are expected to produce results, as well as being fora for exchanging information. The process of informing disadvantaged communities of the nature of a proposal, as well as its impacts and implications, can often best be achieved through one or several workshop sessions. They are also useful for dealing with complex topics where the public needs briefing on technical matters as well as time for detailed consideration. The advantage of workshops is that they can be used at a number of different stages of the public involvement process. They allow for the in-depth involvement of the participants who have an opportunity to work out value priorities and evaluate alternatives.

Workshops are meant to work around small groups, the optimum size being 5-7 people. However, the need to have all interests of the public represented usually means that most small group meetings will have as many as 20-25 participants. Despite this constraint a number of small group processes have been used in the workshop setting to improve its effectiveness. The more common ones are

brainstorming, the Nominal Group Technique and the Delphi Technique (the latter two techniques have been discussed above).

*Brainstorming:* "Brainstorming" is a group technique designed to increase the group's creativity. Everyone is encouraged to come up with as many ideas as possible. Usually these ideas are recorded on a flip-chart or blackboard. In addition to contributing ideas of their own, participants should also suggest how ideas of others can be expanded and improved or how two or more ideas can be combined into a new idea. Brainstorming is not designed for the evaluation of ideas. Its use is primarily one of identification. It also provides a "psychologically safe" climate in which people feel free to participate without fear of being judged. The disadvantages of this technique are that some people react to it as being gimmicky, and it may also generate so many solutions that it is hard to evaluate them all. There is also the potential for groups to get carried in a certain direction in a "bandwagon effect" which reduces its effectiveness in identifying a wide range of issues.

### *Limitations*

Workshop participants have to be properly informed of the proposal, as well as the issues under consideration. This usually involves the preparation and distribution of material prior to the workshop which is time-consuming and costly. Employing workshops in disadvantaged communities will be a time-consuming task and will require commitment since several workshops may be needed simply to provide background information on the proposal and issues of concern.

Since the number of participants in a workshop must be small, there is the risk that certain individuals or interest groups may be excluded.

### *Guidelines*

The optimum size for group effectiveness is 5-7 people, and should not exceed 20-25 participants. Methods which can be used to prevent this problem include:

repeating meetings; holding a daytime workshop, followed by an evening report-back meeting, or through consultation with a wide variety of interested and affected parties, allow the people to identify community representatives who should participate in the workshop.

The following steps are useful in designing a workshop:

- i. Identify the desired result/product: In this step you identify precisely what product should result from the workshop, such as familiarising participants with the proposal, identifying alternatives, a ranking of alternatives, or compiling a list of issues which should be assessed as part of the EIA.
- ii. Identifying the resource information the public will need: If the public is to assist in developing alternatives, evaluating alternatives, or identifying issues or impacts, there is certain basic information they will need in order to respond. This information should be prepared in a simple and understandable format, written in layperson's language and should preferably be circulated to participants before the workshop. Frequently this material is included in a small workbook which also contains team assignments, exercise instructions, and other background material on the study.
- iii. Design a series of activities which will result in the desired result/product: In some cases there may be previously used workshop formats which will result in the desired product. If not, it will be necessary to design a set of activities which will produce the needed results. The usual technique is to provide simple clear instructions (either written or oral) for group activities and group responsibility, both in how the activity is completed and the product which is produced.
- iv. Design simple mechanisms for evaluating workshop product. Once participants have worked together to identify alternative solutions or probable impacts, there is a final need for participants to evaluate the products that have been

produced or to place some priority as to which are most significant. Without an opportunity to evaluate, participants may feel restricted by the workshop format or feel that all the points in the workshop are receiving equal value regardless of relative merit. This evaluation could include the completion of a written response form, ranking items in a priority list, utilizing a straw vote, or utilizing a weighted voting system based on the highest priorities (as is used in the NGT). Without some opportunities for evaluation, participants are likely to feel that the exercise is incomplete, and may be concerned that all the evaluation is left to the discretion of the facilitator or consultant, with the risk that some of their major concerns and priorities may not receive the same value that they would have assigned to them.

### **Advisory Groups**

Advisory groups are one of the most frequently used public involvement techniques. They usually consist of a relatively small group of people who represent various interests, points of view or fields of expertise to advise the proponent or consultant on the issues of concern associated with the proposed actions or a specific proposal. While advisory committees can go under a variety of names (e.g. citizen's committees, consumer advisory councils/panels or working committees), they basically serve the function defined above.

Advisory groups have a number of advantages, as:

- they provide a cross-sampling of public views and concerns;
- members of the group have a chance to become informed about the issues before coming to conclusions and have a better understanding of the consequences of decisions - the result being that their advice combines a citizen's perspective with a thorough understanding of the situation;
- personal relationships are established which result in members of the group developing a deeper understanding of the concerns of other interests, and which also serve as a moderating influence on more extreme ideas;

- advisory groups may be able to reach consensus among conflicting groups because of established relationships and an understanding of the issues of concern to the different group;
- they can serve as a communication link back to the constituencies they represent;
- they can assist in strengthening community organisations, and
- they can assist in determining the terms of reference for the EIA.

### *Limitations*

Despite these advantages there are certain pitfalls to advisory committees which should be kept in mind. They can become expensive, especially if members' expenses are paid. The members of the advisory committee may not represent all the views of the different publics. An advisory group should not be wholly appointed otherwise it is likely to be seen as unrepresentative and undemocratic. The public may perceive such an advisory group as a decision-making body when its function is in fact only advisory. There must be an awareness that committees such as these can be undermined if divisions occur amongst their members. In some circumstances the search for consensus can lead to unsatisfying compromises for certain constituencies.

### *Guidelines*

An advisory group must be representative of the public who may have an interest in, or be affected by, a proposal. Extensive consultation with interested and affected parties prior to the establishment of an advisory group is thus important. The group position with regard to decision making must be clearly defined at the outset.

It is suggested that a written agreement which outlines the group's role and responsibility to this constituency is drawn up. The period over which the advisory group will function must also be clearly stated. It is essential that members of the advisory group maintain regular communication with the constituencies they

represent. This could be in the form of newsletters, public meetings, small group report-back meetings and discussions with other representatives from their constituency.

The individual or agency responsible for scoping should consult with the advisory group on a regular basis. This will ensure that the advisory group feels that the views of their constituencies are being heard by managers and decision-making authorities.

### **Charrettes**

A charrette is a prolonged meeting or series of meetings, which brings together all the key interested and affected parties with the aim of defining issues and developing goals, resolving conflict, solving problems and reaching mutual agreement of all parties concerned. Participants of charrettes meet in highly intensive sessions and work to find solutions to problems within agreed upon deadlines. Some charrettes may last an entire week-end round the clock at a conference centre or private retreat, or be conducted as a series of weekly meetings.

Charrettes are usually undertaken when developing a set of recommendations, preparing a plan or final report, or resolving a complex development proposal involving conflicting social needs. A charrette is often useful in reaching agreement amongst many interested and affected parties on issues which require prompt resolution, over a short but intensive period.

Three elements of a charrette are crucial to its success:

- all major interested and affected parties must be present;
- all participants should remain in the meeting until consensus is reached, and
- all final decisions or plans must reflect the consensus of all participants.

### *Limitations*

A charrette requires considerable commitment of time and effort by each participant, as well as comprehensive advance planning of site location arrangements and invitation issuing, discussion time scheduling and agreement on decision deadlines. Thus the technique can be time consuming and expensive for the proponent sponsoring and organising the charrette.

Charrettes require very good public outreach and public access to information in order to ensure a well attended and an effective public meeting. A charrette will not be effective if some key interested and affected parties are not present, as the process hinges on group consensus.

### *Guidelines*

In order for the Charrettes process to achieve success, major publics need to have a sense of the urgency and priority of achieving consensus about the conflict. All the participants must be present. They need to be committed to remaining at the venue until a consensus is reached and a new plan that is acceptable to the participants is formulated.

As the Charrettes process can often take a number of days, it is important to find a venue where the major publics can meet without interruption until a consensus is reached. Depending on the estimated length of the process, catering and accommodation may need to be provided. All preparation needs to be done before the Charrettes process starts so that there is no need to communicate with people who are not participants in the process.

Another important aspect is that the participants in the Charrettes need to have credibility within their organisation, agency or group, as the decisions that are taken and plans that are formulated need to be implemented. The organisations, agencies

and groups cannot easily back down from these commitments without losing face and credibility.

## **Negotiation**

Negotiation is a process where all parties in conflict agree to participate in a meeting or series of meetings, where representatives from all parties will be present and discuss the issues surrounding a project proposal. The purpose of negotiation is to generate alternatives and evaluate options which will be acceptable to all parties involved. All represented parties will have the opportunity to approve, or disapprove, of agreements that are reached.

The process of negotiation places the responsibility on all parties to find a workable solution which is likely to be acceptable to everyone when implemented. The emphasis lies on the participation of all interested and affected parties, as well as the provision of a forum for discussion and agreement on interests, needs and solutions.

### *Limitations*

All parties must be represented. As negotiation is a voluntary process, one or more parties may not wish to participate in negotiation and can either refuse to attend or drop out of the process at any time. This will weaken the solutions reached or possibly even terminate the entire process. Negotiations take time before agreement is reached by all parties involved and may cause severe delays in the development of a project proposal.

### *Guidelines*

The preparation for negotiation involves the following aspects:

1. A neutral, acceptable third party needs to be selected to co-ordinate the negotiation process and to act as the negotiator between the parties at conflict.
2. All the parties that are involved in the negotiation process need to be identified and then appropriately represented by individuals who have credibility within their organisation, agency or group, and who have an excellent understanding of the issues of conflict.
3. The issues around which the negotiation will occur need to be identified.
4. Differences with respect to data, values and assumptions between those negotiating need to be identified. This acts as the basis for understanding the causes of conflict.
5. All parties need to agree on the relevancy and reality of the issues and priorities need to be established for each aspect of the conflict. For each priority area the initial position or demand, a fall-back position and a bottom line position need to be established.
6. Numerous and appropriate alternatives and arguments need to be generated. These need to be evaluated for their strengths and weakness by all the parties.
7. Once these steps have been achieved, then the lines of communication and the negotiation strategies should be set up. It is during this stage that there needs to be an assessment of the physical and time limitations around which a framework of conflict resolution can be established. All the parties involved need to agree to this framework.

During the negotiating process the guidelines are as follows:

1. Each party needs to establish their power base.
2. All points and issues are negotiable.
3. Deadlines for decisions should be set.

4. Personal accountability for decision-making needs to occur.
5. There needs to be face-to-face negotiations between parties and private negotiation between the negotiator and each party.
6. Proposals and requests need to be clear and simple.
7. Ultimatums should be avoided unless they can be fully backed up.

## **Arbitration**

Arbitration is a conflict resolution process whereby the parties in conflict agree to involve a third, neutral party or person to serve as an arbitrator. The arbitrator acts within guidelines agreed upon by all the parties involved and must only deal with the facts. After whatever research or interaction with the conflicting parties is needed, the arbitrator will offer a solution that is considered by him/her to be equitable to both parties.

Arbitration can either be binding or non-binding. In a binding arbitration process, all parties will have agreed in advance to accept the arbitrator's recommendation, which will be legally final. In a non-binding arbitration process, the parties may reject the solution recommended by the arbitrator. Usually however, there is considerable political or public pressure for parties to accept the arbitrator's recommendation.

## *Limitations*

Several preconditions must be met before an arbitration process will be possible or effective:

- there must be a general agreement between the parties in conflict that it is beneficial to all groups to find a timely solution to the conflict, rather than to continue fighting for a one-sided victory;
- there must be a neutral third party, acceptable by all conflicting groups, and
- there must be a willingness to accept the arbitrator's position of conflict resolution, and to take the solution offered by the arbitrator seriously.

*Guidelines*

The guidelines for arbitration are the same as those for negotiation as arbitration involves the negotiation process. However, it is important to realise that in order for arbitration to be effective the parties must be at a stage where the conflict cannot be resolved because for one side to get something, the other must give up something. Neither can afford to have the issue unresolved because of the mutual dependency. Therefore, a neutral, acceptable third party is called in to help resolve the conflict.

**Mediation**

Mediation is a voluntary process agreed upon by conflicting parties, where an impartial third party with no decision-making powers in negotiation, is involved to assist with the process of reaching agreement among the parties directly involved. The mediator serves merely as a conduit for communication, helping the conflicting parties to focus on the substantive issues of the controversy.

The mediator must be skilled in conflict resolution techniques, and must remain entirely neutral throughout the mediation process. The mediator suggests productive procedures for rapid conflict resolution, and persuades contending parties towards mutual settlements of disputes.

*Limitations*

Mediation is voluntary and will only work when all parties agree to accept a mediator, and if the mediator selected is credible to all parties involved.

*Guidelines*

The guidelines for mediation are the same as those for negotiation, except that the parties must be at a point where they can accomplish more by negotiating than by continuing to fight. A stalemate would be more detrimental than negotiation.

The importance of using a combination of participation techniques in the scoping process must be re-iterated. Different techniques would be more appropriate at different stages of the assessment process and should be employed accordingly.

# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 4

### EXAMPLE OF A TECHNICAL ADVICE NOTE

#### GROUNDWATER CONSIDERATIONS IN THE APPRAISAL OF COASTAL TOWNSHIP/RESORT DEVELOPMENT APPLICATIONS

##### INTRODUCTION

In planning a development such as a township or resort in a coastal area, careful consideration needs to be given to the hydrological characteristics of the proposed development site. Inappropriate siting, design and layout of developments and inconsiderate activities during the construction phase of a project, can result in major changes to the quality and quantity of groundwater resources, which could have long-term and far-reaching implications once the development is complete.

Hydrological characteristics of the site and surroundings may also place major constraints on the proposed development. For example, an area which has a high water table and may be seasonally flooded would be unsuitable for a recreational parkland.

The aims of this Technical Advice Note are:

- 1) to make developers, planners, assessment officials and decision-makers aware of some of the environmental constraints placed upon development activities by hydrological processes and characteristics;
- 2) to provide background information, for those evaluating township and resort development applications, on the potentially deleterious effects development

may have on groundwater resources and consequently on other ecological, aesthetic and social components of the system, and

- 3) to provide information which will enable developers and planners to communicate more effectively with hydrological experts upon whom they must rely for technical information and advice.

## THE HYDROLOGICAL CYCLE

The movement of water through the environment is termed the hydrological cycle and is represented diagrammatically in Figure TAN 1.1. During its circulation from ocean to atmosphere to earth and back to ocean, some water is stored temporarily in rivers, lakes, the soil or groundwater and becomes available for use. Groundwater is a subsystem of the hydro- logical cycle and is derived mainly from precipitation that falls on the earth's surface. For water to collect underground, there must be an area of land surface (called an intake or recharge area) into which the precipitation can infiltrate and charge the storage space within the rocks and soils. Because groundwater is not a visible component of the hydrological cycle, it is often overlooked in the planning and development process.

Any unit of land has its own specific hydrological characteristics which are dependent on the nature of the soils and substrata as well as the differing land-uses in the area. Any development activity may initiate changes to the hydrology of a site and may even affect the hydrological characteristics of the surrounding area. The modifications to the hydrology of an area after development vary according to the scale, design and construction activities of the specific development.

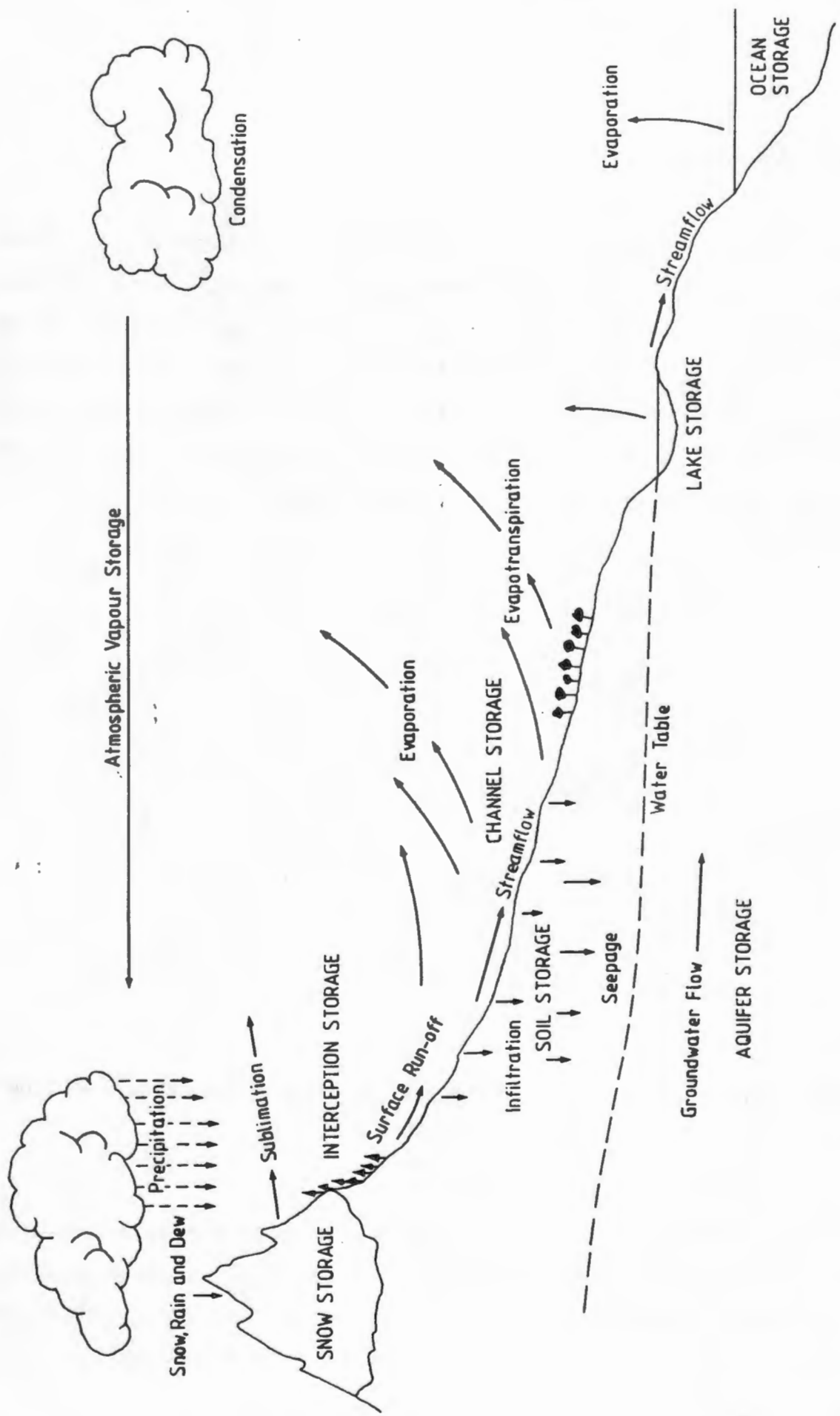
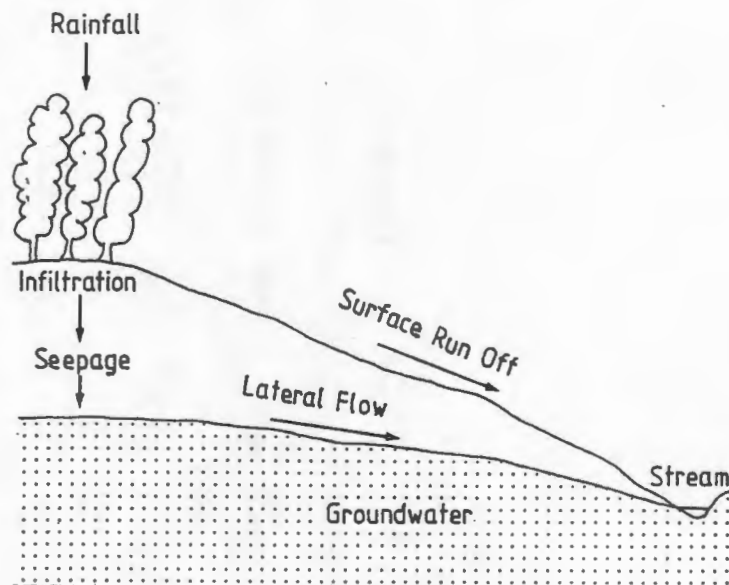


Figure 1AN 1.1 The hydrological cycle. Adapted from Clark, et al 1981.

## GROUNDWATER

Development interferes with the groundwater/surface run-off/stream flow relationship. Under normal circumstances rainfall is intercepted by vegetation cover: part flows as surface run-off to streams and rivers, while part slowly seeps through the soil and charges the groundwater. Horizontal flow of the groundwater takes place on a gradient towards streams and rivers and so contributes towards their flow (see Figure TAN 1.2). The main factors governing the balance between surface run-off and seepage are vegetation cover, soil texture and slope.



**Figure TAN 1.2:** The relationship between groundwater, surface runoff and streamflow

1. **Vegetation cover.** Vegetative cover and therefore land use are important controls of infiltration. Generally, good vegetation cover (indigenous as opposed to alien vegetation) impedes surface flow and increases infiltration. Vegetated soils generally have considerable water storage potential, especially when the soil has a high organic content.

2. **Soil texture:** In coarse-textured soils such as sands, which have large pores, seepage occurs readily. Clay soils, on the other hand, which have exceedingly fine pores, are not easily infiltrated but can retain large quantities of water.

3. **Slope:** The gradient of the slope is an important factor governing run-off: generally the steeper the slope, the higher the run-off and the lower the infiltration.

None of the above factors operates in isolation, and the balance between surface run-off and seepage is the result of these factors operating in combination.

Development disrupts this balance. Vegetation cover is removed and replaced by a variety of hard surfaces. This results in little infiltration as most of the rainfall is discharged as surface run-off, and consequently the groundwater is not optimally recharged. Furthermore, construction and landscaping activities may change slopes and drainage patterns, which may add to the problem described above.

In investigating the groundwater resources of a site an important consideration is the existence of aquifers, which can be used as a source of water supply. In simple terms, aquifers can be classified into three types: unconfined aquifers, confined aquifers and perched aquifers (see Figure TAN 1.3).

**Unconfined aquifers** occur in permeable rock lying above an aquifuge or aquiclude (impermeable or semi-permeable rock strata respectively), so that the groundwater is in direct vertical contact with the atmosphere through the open pores of the aquifer strata. These aquifers are charged by seepage from the area above them and can only be used as a source of water supply by pumping within the limits of the recharge area.

If an aquifer is overlain by an aquifuge or aquiclude, so that it is contained between two layers of impermeable or semi-permeable rock strata, it is termed a confined aquifer. The recharge area of a confined aquifer may be a considerable distance from any abstraction point, as is illustrated by Figure TAN 1.3.

**Perched aquifers** develop above shallow aquifuges or aquicludes of limited extent, and they are small storage areas held above the surrounding water table. These small systems are often ephemeral, developing during a single storm or wet season. They are widespread, but only of local significance.

Aquifers are charged directly by seepage and are therefore at risk of contamination by any activity that pollutes the recharge flow path. These considerations are of particular importance where an aquifer is the source of domestic water supply.

Identifying contamination in confined aquifers is fairly straightforward: normal pollution monitoring procedures would detect contaminations in a river or stream relatively quickly. However, contamination of a confined aquifer may only be detected when it is polluted to such an extent that it is essentially unserviceable (sites A and B in Figure TAN 1.3 respectively).

## TYPICAL PROBLEMS

1. Development disrupts the balance between surface run-off and seepage as most of the rainfall is discharged by surface run-off. This results in surges in stream flow which may disrupt stream plant and animal communities, increase scouring action of stream beds and re-suspend deposited solids. If the magnitude of the water discharged is large, flooding may result.
2. If surface run-off is not discharged directly to stormwater drains, erosion may occur. This problem varies considerably depending upon the nature of the soils and vegetation, the gradient of the terrain and the quantities of water discharged.
3. Development can reduce the rate at which groundwater is recharged, so that the water table may fall. Excavation, earthmoving or dredging activities as well as extensive drainage of a site may disrupt the normal recharge process and groundwater may not be replenished. This may have adverse effects on the ecology

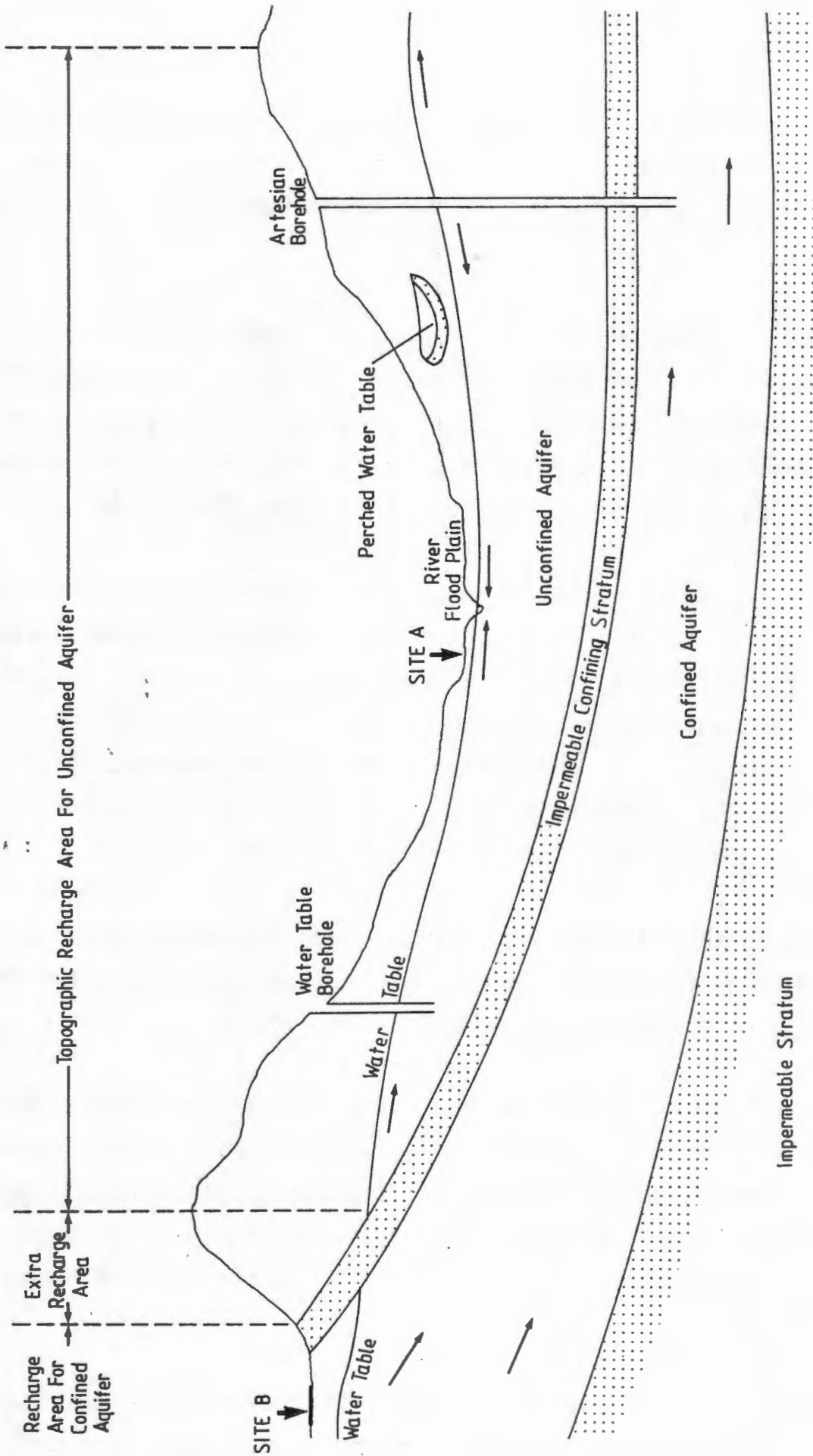


Figure TAN 1.3: Different aquifer types  
Adapted from Clark et al, 1981

Figure TAN 1.3:

of the development site and even the surrounding area. Plant communities and even individual trees, dependent on high water tables, may die off should water tables fall. Loss of important plant communities could have indirect effects on other wildlife populations.

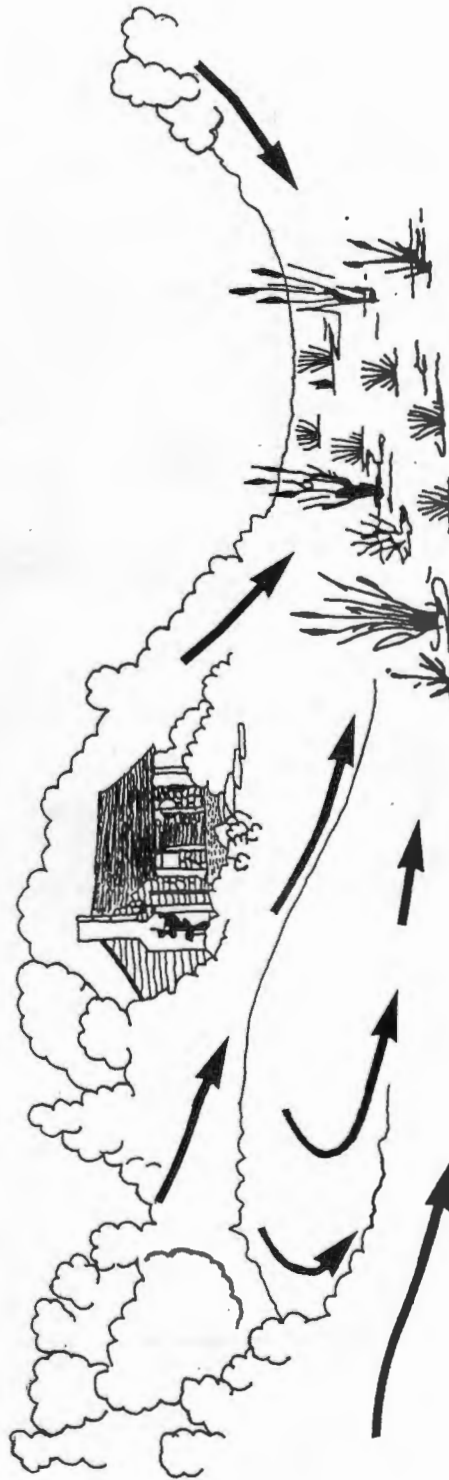
4. Careful consideration needs to be given to contamination of groundwater, especially when there are abstraction points for water supply for domestic or other use in the area. Groundwater may be contaminated by septic tanks, rubbish tips and the careless disposal of domestic effluent. In this regard the siting of these services in relation to water abstraction points is very important (see Figures TAN 1.4 - 1.9).

5. Pumping groundwater from a borehole lowers the water table in the vicinity of the borehole, forming a cone of depression (see Figure TAN 1.10). The greater the rate of pumping, the steeper the slope of the cone of depression, so that the depth from which water has to be pumped increases (see Figure TAN 1.11). The steepness of the cone of depression is also dependent on the rate of recharge of the borehole, so that ultimately, the depression in the water table around the borehole is an equilibrium between borehole pumping and recharge rates.

Excessive pumping not only increases the depth from which water can be abstracted, but can also lower the water table in an area to the extent that other abstraction points in the area are affected.

6. In coastal areas, the excessive pumping from a borehole can result in saline intrusion of the aquifer. In coastal unconfined aquifers, fresh groundwater overlies saline groundwater (see Figure TAN 1.12). If the freshwater table is lowered through pumping, the interface between the fresh and saline water is raised. Excessive pumping can raise the freshwater/saltwater interface sufficiently for saline water to intrude the borehole.

7. Pumping water from an aquifer may reduce the pore water pressure within the aquifer rock strata, so that compaction of this material results. Excessive pumping



Paying heed to drainage patterns and not building in wet areas avoids problems in placing water abstraction points and septic tanks, as well as minimising runoff and erosion problems.

Figure TAN 1.4

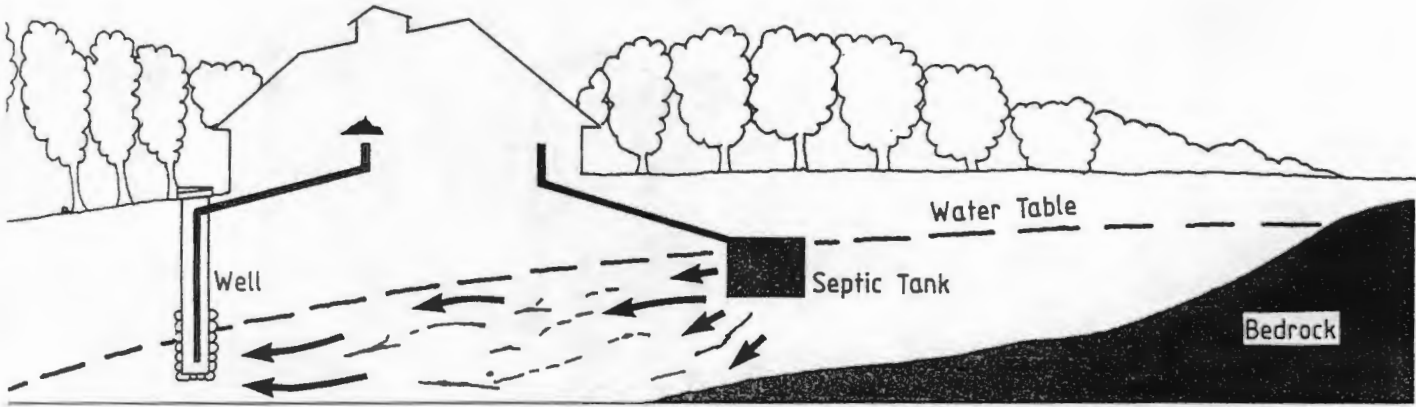


Figure TAN 1.5:

**Position of septic tank**

A water abstraction point which is too close to a septic tank or which is downstream of the septic tank may be contaminated

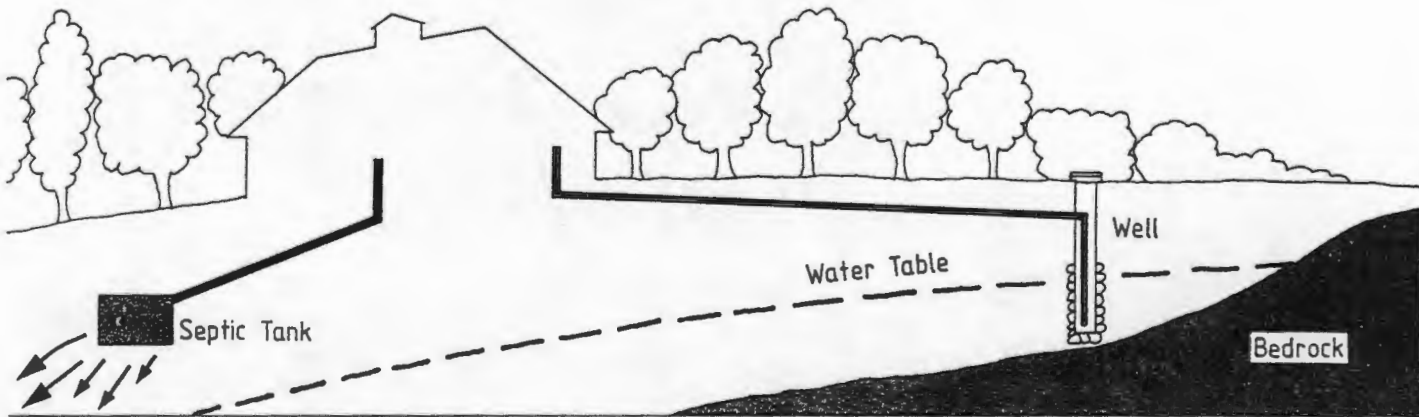


Figure TAN 1.6:

**Solution to Figure TAN 1.5.** The water abstraction point is upstream of the septic tank, and the septic tank is placed above the aquifer, so that purification of sewage takes place before the effluent joins the aquifer.

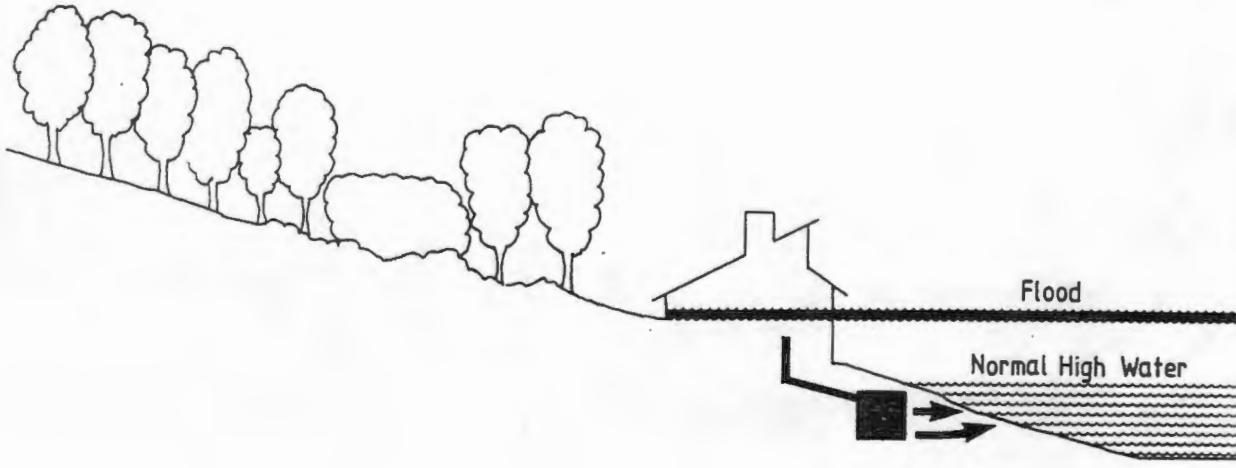


Figure TAN 1.7:

Building on a floodplain does not allow septic tank installation as the water table is too high, and will cause the surface water to be contaminated

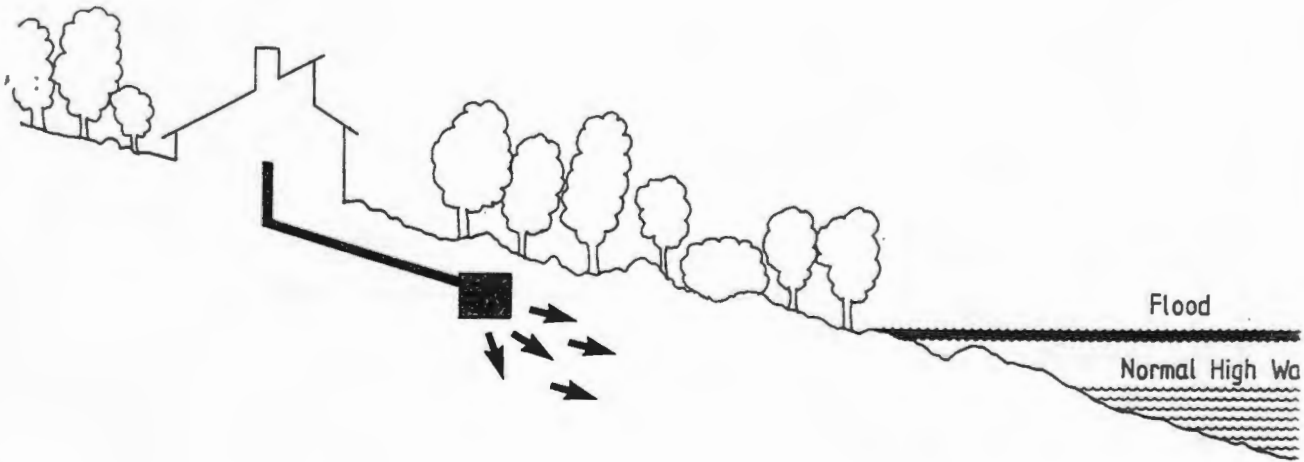


Figure TAN 1.8:

Solution to Figure TAN 1.7. Higher ground allows proper purification of sewage and prevents pollution of surface water.

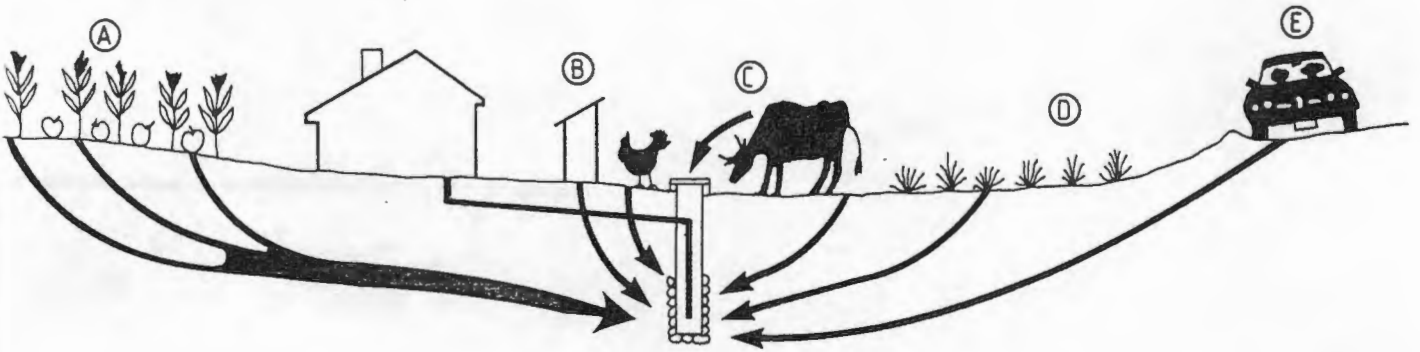


Figure TAN 1.9:

**Position of water abstraction point**

Any water abstraction point placed too near (A) a garden where fertiliser is used, (B) a septic facility, (C) livestock, (D) wetlands or (E) a roadway may be polluted as the pollutants may not be properly treated by passage through the soils.

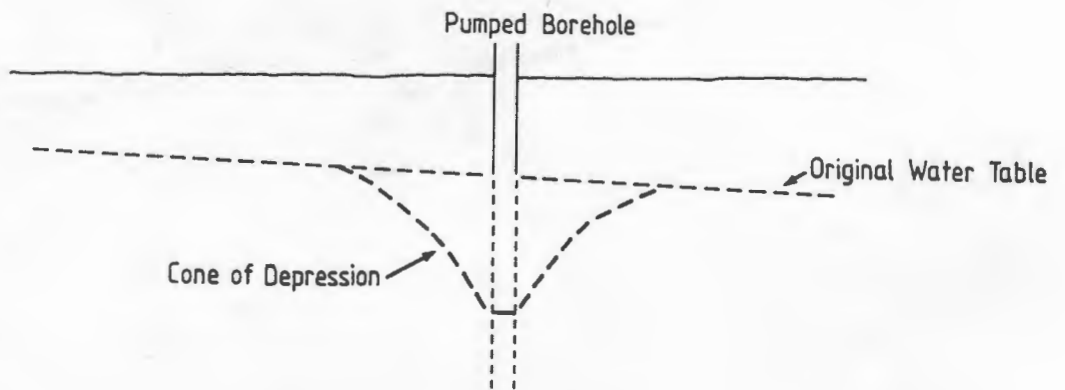


Figure TAN 1.10:

**Cone of depression**

Pumping from a borehole lowers the water table in the vicinity of the borehole.

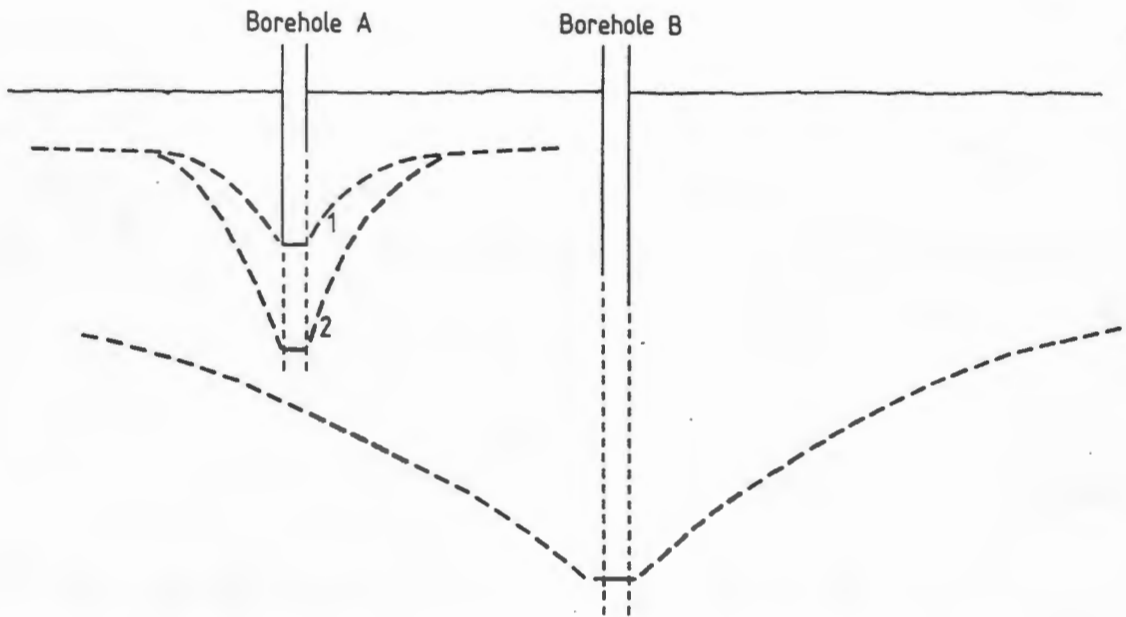


Figure TAN 1.11:

**Excessive pumping from a borehole**

An increased rate of pumping increases the depth of water in Borehole A from level 1 to level 2. If the level of the water in Borehole B is deep through excessive pumping and an inadequate recharge rate, then any other boreholes in the area (e.g. Borehole A) would have to be deepened to reach water.

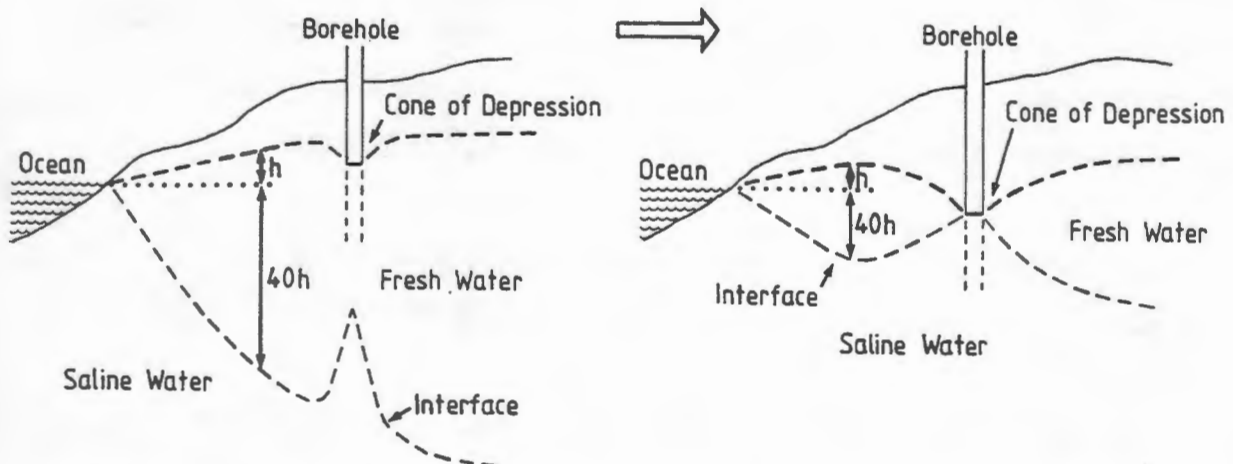


Figure TAN 1.12:

**Excessive pumping from a coastal unconfined aquifer shifts the freshwater/saltwater interface and results in a saline intrusion of the borehole. For every 1 metre that the freshwater table is lowered through pumping, the freshwater/saltwater interface is raised by 40 metres.**

can reduce the pore pressure sufficiently to transmit the compaction to the ground surface, where subsidence then occurs. This results in obvious problems such as the cracking and warping of buildings and roads, as well as more subtle problems such as alteration of drainage patterns.

## EXPERTISE

The assessment of development proposals with potential groundwater implications is highly dependent upon expert advice. Since it is a very technical component of the development appraisal process, it is unlikely that assessment officials and decision-making authorities will have the expertise to consider all the relevant aspects. It is important to identify developments that are likely to have such impacts as those described above at an early stage in order that adequate expertise may be applied to the problem.

Various organisations are valuable sources of expertise. These include the Department of Water Affairs, Division of Hydrological Research, research institutions such as the Council for Scientific and Industrial Research, relevant university departments and engineering, geological and hydrological consultants. Such organisations should be consulted for advice on the following aspects:

1. Any characteristics of the site which may preclude certain types of development or development in particular areas of the site.
2. The effect of the proposed development on the hydrological balance.
3. The effect of the proposed development on the groundwater regime in terms of quality, quantity, depth and gradient of the water table and the direction of the flow.

4. The effect of the proposed development on the natural drainage patterns of the area.
5. The siting of septic tanks, rubbish dumps and other effluent disposal sites.
6. Identification of potential sites for boreholes/water abstraction points where groundwater is required for domestic use. This would involve testing of borehole yields and determining the recharge potential of the aquifer, bearing in mind the seasonality of demand for water in coastal resorts.

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# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 5

### A PROCEDURE FOR ASSESSING RECREATIONAL CARRYING CAPACITY\*

#### DEFINING RECREATIONAL CARRYING CAPACITY

Although the concept of carrying capacity has been widely used in outdoor recreation planning and resource management, there is still no standard procedure for assessing it (Jaakson et al, 1976). Nevertheless, all definitions of recreational carrying capacity have two main elements: maintenance of the integrity of the resource base and provision of a recreation experience of high quality.

A recent review of the concept of recreational carrying capacity has been published by Pigram (1983). His interpretation of the concept is based on the ideas expounded by the United Kingdom Countryside Commission. This Commission defines recreational carrying capacity as:

"The level of recreation use an area can sustain without an acceptable degree of deterioration of the character and quality of the resource or of the recreation experience." (Pigram, 1983)

This broad definition has been further refined and four separate categories of carrying capacity are identified. These are: Physical carrying capacity, economic carrying capacity, ecological carrying capacity and social carrying capacity.

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\* Extract from Sowman, M.R. 1987. A Procedure for assessing Recreational Carrying Capacity of Coastal Resort Areas. *Landscape and Urban Planning*, 14: 331-344

### **Physical Carrying Capacity**

Physical carrying capacity is concerned with the maximum number of "use units" (people, vehicles, boats) which can be physically accommodated in an area. It is a design concept, as when referring to the capacity of a car park, a spectator stand or a theater (Pigram, 1983).

Capacity figures for amenities such as car parks can easily be calculated since the area under construction has finite physical limits. Determining the physical carrying capacity of the water surface of an estuary for boating activities becomes more and more complicated. The physical carrying capacity of the water surface cannot simply be determined by calculating the number and size of craft that can be accommodated on a defined area of water, but must include an assessment of the space requirements for different boating activities.

Consideration of safety is also necessary. Although figures for safe boat-densities have been derived and are frequently quoted in the recreation literature (Tanner, 1973; 'Cape Coastal Survey, 1973; Jaakson, et al., 1976; Urban Research and Development Corporation, 1977), the criteria for determining these figures are seldom explicit. In general, it would appear that these theoretical boat-densities are based on what past research has shown to be generally accepted standards for safe-boating (Jaakson, et al., 1976).

For recreation activities such as boating, an assessment of the capacity of related shore facilities such as car parks, trailer parks and boat ramps also contributes to determining the physical carrying capacity of the recreation area. In most recreational settings, facilities capacity can usually be enlarged if the necessary finance is made available.

According to Herbelein (1977), the upper limit of capacity is the amount of physical space available for recreational use. In this study, the upper limit of capacity is the amount of space required to ensure recreational activities are at a safe and efficient

density. Thus determination of physical carrying capacity serves as a starting point for assessment of recreational carrying capacity.

### **Economic carrying capacity**

Economic carrying capacity relates to situations where a resource is simultaneously utilised for outdoor recreation and economic activity, such as a domestic water-supply reservoir. Here, the concern is to establish recreation-use levels that do not unduly interfere with the non-recreational activity so as to reduce the economic viability of the resource.

In such situations, it is necessary to undertake an ecological study in order to determine the economic tolerance level of the system to different levels of recreation use.

In most countries, however, coastal resources utilised for economic activities are seldom simultaneously available for recreational use, although the utilisation of estuaries or coastal lagoons for both oyster farming and watersports is one such example. Thus, routine assessment of the economic carrying capacity of a coastal area where recreational development has been proposed, will not be required.

### **Ecological Carrying Capacity**

Ecological carrying capacity is concerned with the maximum level of recreational use, in terms of numbers and activities, that can be accommodated by an area or an ecosystem before an unacceptable or irreversible decline in ecological values occurs (Pigram, 1983).

The difficulty with this definition is deciding what constitutes an unacceptable change or irreversible decline in ecological integrity and upon what parameters this value judgment should be based. In addition, there are problems associated with monitoring environmental change caused by recreation activities. The major problem

is controlling the variable under investigation: the complex interaction of components in an ecosystem cannot easily be separated. The dynamic fluctuating nature of ecosystem processes also makes it difficult to define a base level against which to measure human-induced change. Recreation activities are also variable, since levels and intensity of recreational use are not uniform. Also, most recreational sites have different boundaries to existing ecosystems, thus adding to the difficulty of making an integrated functional analysis.

In the absence of scientifically reliable methods for predicting ecological thresholds, experienced ecologists use their intuition and understanding of the resilience of different ecosystems to determine ecological thresholds, and to identify areas where uncertainty exists and where conservation recreation use levels should be adopted.

### **Social Carrying Capacity**

Social carrying capacity is concerned with the visitor's perception of the presence (or absence) of others simultaneously utilising the resources of an area. This concept is concerned with the effect of crowding on the enjoyment and appreciation of the recreation site. Social carrying capacity is:

"the maximum level of recreational use, in terms of numbers and activities, above which there is a decline in the quality of the recreation experience from the point of view of the recreation participant" (Pigram, 1983)

Public opinion provides valuable insight into people's perception of what constitutes a recreational experience of good quality. In different recreation settings and for different socio-economic groups, the level of crowding which is tolerated is known to vary. Such input can greatly assist decision-makers in determining the levels of crowding that will be acceptable to the majority of users. Questionnaires, public surveys and interviews are some of the methods available to the researcher to obtain this information.

## ASSESSING RECREATIONAL CARRYING CAPACITY

From the above, it is clear that no single number exists that defines the recreational carrying capacity of an area. Rather, combinations of factors, including an assessment of the spatial requirements of the activity, the resilience of the ecosystem to different kinds and levels of use, and the attitudes of the recreationists to different levels of crowding, must all be considered when determining the recreational carrying capacity of a given area.

An outline of the proposed assessment procedure is presented diagrammatically in Figure 1. The procedure seeks to acquire pertinent information, ascertain current recreational pressure, project resource demands and assess the physical, ecological and social carrying capacity of the area for major recreational activities. Constraints associated with further developments are identified, and finally the appropriate level of recreational use for the area is determined.

### *Stage 1: Acquire pertinent information on the bio-physical environment*

The first stage in the procedure is to acquire relevant information on the physical and biological components of the coastal system. For example, information on marine seaweeds will be relevant in areas where swimming and power-boating are popular, since dense seaweeds growing along the shore may restrict access for power-boats, be hazardous to swimmers and can even provide breeding grounds for species which may be undesirable to recreationists.

The sort of information which will be required on the physical components of the ecosystem will include facts on the physical characteristics of the beach such as available beach space, presence of rocky outcrops, material of beach, slope of beach and the prevailing wind and surf conditions. This information can be obtained from literature reviews, on site surveys, aerial photographs and discussions with local people knowledgeable about the area.

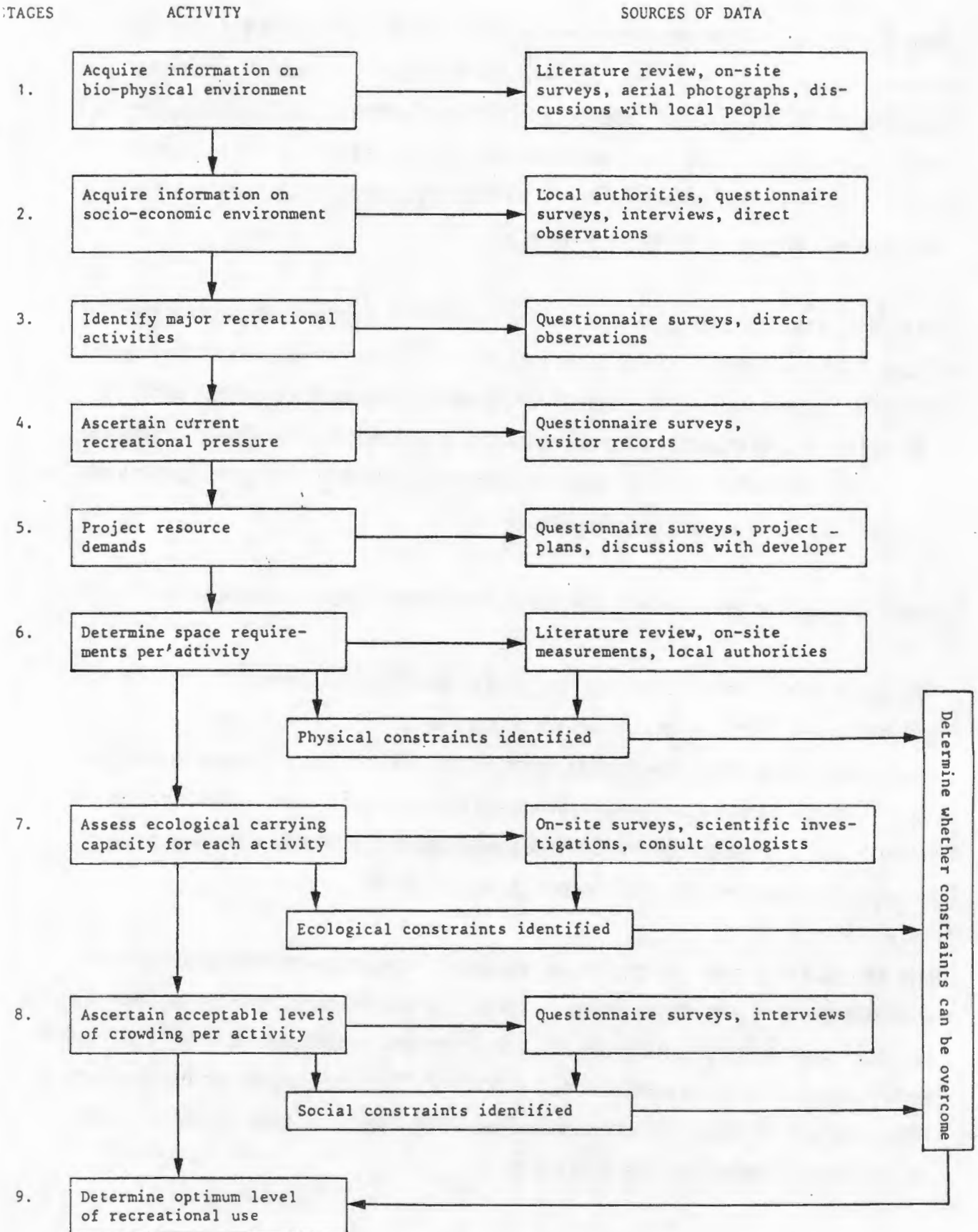


Figure 1. Procedure for Assessing Recreational Carrying Capacity

*Stage 2: Acquire pertinent information on the socio-economic environment*

Socio-economic information necessary for the assessment will depend on current levels of development in the area and the nature of the recreational development proposal. Information should be obtained on:

- (1) the number of residential sites in the area;
- (2) the percentage of developed sites;
- (3) visitor numbers that can be accommodated by holiday accommodation, and
- (4) existing services and facilities.

In addition, quantitative information on recreational infrastructure, such as size of parking areas, number and size of boat launching sites, number and location of access to roads, should be gathered. This information should be available from local authorities, and where possible should be confirmed by on-site surveys.

Information may also be required from users of the area concerning:

- (1) frequency of visits;
- (2) length of stay;
- (3) reasons for visiting the area;
- (4) recreational activity preferences;
- (5) attitudes towards proposed recreational development, and
- (6) socio-economic characteristics.

This information can be obtained from questionnaire surveys or structured interviews. To ensure a high response rate when conducting a survey of this nature, it is recommended that questionnaires are handed out to visitors and that they be requested to return them to a suitably labelled roadside box on completion (Grieg, 1977). The most appropriate time to conduct a survey of this nature is during peak holiday periods so that a true reflection of maximum visitor pressure can be obtained.

*Stage 3: Identify the major recreational activities pursued*

There are certain activities which are generally associated with coastal recreation, but the most popular activities pursued in an area will depend on prevailing environmental conditions and preferences of the recreational population. For example, a rocky coastline may create conditions highly suitable for surfing, but unsuitable for power-boating. Information on major recreational activities can be obtained from questionnaire surveys and should be confirmed by on-site observations.

An example of what question to ask in order to elicit information on recreational activity preferences is given in Table 1. Analysis of this question will indicate the major activities pursued in the area and will also give participation rates per activity of questionnaire respondents, which is essential information for the next stage of the procedure.

*Stage 4: Ascertain the current recreational pressure*

In order to ascertain current recreational pressure imposed on the coastal area in question, data on (i) seasonal population and (ii) participation rates per activity must be obtained. Since these statistics form the basis upon which projections are made and upon which the assessment method proceeds, it is essential that data obtained are as accurate as possible.

(i) Estimate the seasonal population influx

To obtain an accurate estimate of the total number of people that could be present in a coastal area at any one given time, the following statistics are required:

**TABLE 1: AN EXAMPLE OF THE QUESTION TO ASK TO DETERMINE RECREATION ACTIVITY PREFERENCE**

<p><b>QUESTION:</b> Following is a list of things people do when visiting the coast. Please indicate the number of people in your group who participate in each activity listed below. Space is provided for other activities which may be important to you.</p>	
<b>Activity:</b>	<b>No. of People:</b>
Boat fishing	
Shore fishing	
Spear fishing	
Boating	
Water-skiing	
Diving	
Snorkeling	
Sunbathing	
Walking/Hiking	
Boardsailing	
Surfing	
Paddleskiing/Canoeing	
Birdwatching	
Beach combing	
Motorbike scrambling	
Picnicking	
Beach games (specify)	
Other	

- (1) The total number of people that can be accommodated in all privately owned homes.
- (2) The total number of people that can be accommodated in all holiday accommodation such as hotels, cottages and campsites.
- (3) The average number of day visitors.

Estimates of total population numbers for (1) can be obtained by simply asking the question "How many people are staying in this house tonight?" From questionnaire analysis it will be possible to determine the average number of people per household. Since the total number of developed residential sites is known (see Stage 2), it will be possible to calculate the potential number of people that can be accommodated in all dwellings by multiplying the average number of persons per site by the total number of developed residential sites. From case studies undertaken at the coastal towns of Infanta and Whitesands on the South Cape coasts, South Africa, during December 1983 and December 1984, respectively, the average number of people per residential site at both new towns was found to be 6.9 (Sowman, 1984). Statistics for (2) should be available from visitor record books, caretakers of campsites and managers of hotels.

Obtaining accurate estimates of day visitors (3) is more difficult, and the method employed will depend on the nature of the coastal area. For example, if there is only one access route to the recreation site, automatic car counters can be used to record the number of vehicles. The average number of people per vehicle can be ascertained by direct observations made over a few days. By multiplying the total number of cars by the average number of people per car, the number of day visitors can be obtained. In other locations, a more appropriate method may be to conduct roadside interviews - preferably at an entrance or exit to a parking area. The interview need only take a few seconds since the only information required is whether the occupants are day visitors or not. The number of people in the vehicle can be recorded by observation.

Addition of these sets of figures gives an estimate of the potential recreational population that could be present in the area.

(ii) Ascertain participation rates per recreational activity

Analysis of questionnaires will indicate participation rates per activity of respondents. An estimate of the total number of people participating in each activity can be

obtained by proportional calculation. To illustrate how participation rates per activity are ascertained, the following example will be used. A questionnaire survey undertaken at the coastal town of Infanta, South Africa, in 1983, revealed that 217 out of 893 questionnaire respondents were boat anglers (see Table 2, Column 1). Using the method described to obtain the estimates of seasonal population influx, the potential number of visitors to the area during a peak holiday season was calculated to be 1127. Thus by proportional calculation the actual number of boat anglers was estimated to be 272 (See Table 2, Column 2). The same procedure is used to calculate the actual participation rates for all recreation activities pursued in the area.

In coastal towns where all residential sites are not fully developed, it may be useful to estimate the potential number of people that could be expected in the area when all sites are fully developed and occupied, before calculating the projected population influx associated with the development proposal.

**TABLE 2:       SELECTED ITEMS INDICATING CURRENT AND PROJECTED RECREATIONAL PRESSURE IN THE INFANTA COASTAL AREA.**

Item	Questionnaire Respondents	Current Recreational Pressure	Projected Recreational Pressure
People	893	1127	1817
Vehicles	310	392	632
Power-boats	83	105	170
Boat anglers	217	272	441
Surfers	75	95	153
Board sailors	63	80	129

*Stage 5: Project resource demands*

Having ascertained current recreational pressure, the next stage in the procedure is to predict future recreational demands associated with the proposed township or

recreational development. Firstly, estimates of additional visitor numbers must be made. Examination of project plans and discussions with prospective developers will reveal the nature and size of the development and provide data necessary for calculations. To illustrate how projections are made, statistics from the Infanta study will again be used and the reader is referred to Table 2.

At Infanta, a proposal to develop 100 additional residential sites would potentially introduce 690 (100 residential sites x 6,9 people per household) more people into the area during peak holiday periods (see Table 2, Column 3). Then, using figures obtained for participation rates per activity, the total demand for each activity at this increased population, can be obtained by proportional calculation. For example, the statistics indicate that 272 out of 1127 people are boat anglers, and therefore it can be anticipated that at the increased population of 1817, the number of boat anglers will increase to 441. Although predictions of future participation rates by this method of trend-extrapolation are considered unreliable by some recreation researchers (Mercer, 1977), they do offer a basis for assessing whether the resource base can meet the demands of the projected recreational population.

*Stage 6: Determine the space requirements for major recreational activities*

This stage of the assessment procedure is concerned with the maximum number of people, vehicles or recreational craft that can be physically accommodated in an area. The starting point is to review the literature on recommended physical space requirements for the activities relevant to the study area. Criteria for determining physical space requirements for different activities are seldom explicit in the literature and are essentially based on informed guesses (Yap and Barrow, 1979). However, a knowledge of the range of capacity figures for different recreation activities provides the recreation planner with a yardstick against which to assess whether current or projected pressure is below, within or exceeds the physical carrying capacity of the area.

For example, a brief review of the literature revealed that an average of approximately 4 - 6 hectares of water surface per boat is recommended for safe general-purpose boating (Cape Coastal Survey, 1973; Tanner, 1973; Jaakson et al., 1976; Baud-Bovy and Lawson, 1977; Pigram, 1983). From Stages 1 and 2 of this procedure, information on the area of water surface available for boating will be known. Statistics obtained from Stages 3 and 4 can then be used to calculate average water surface area per boat for current and projected boating numbers. This exercise will indicate whether the amount of water surface can physically accommodate the additional boating pressure associated with the recreational development proposal.

In addition, determining the physical carrying capacity of an area for boating is also dependent on the availability of related shore facilities such as parking areas, boat ramps and access roads. Information, such as the number of vehicles and boat trailers that could be accommodated in the parking areas, would be available from Stage 2 of this assessment procedure. From direct observations, it would even be possible to determine the average time taken to launch and land a boat and thus calculate the maximum number of boats that could utilise a boat ramp per day. By assessing physical carrying capacity of ancillary shore facilities this way, it is possible to evaluate whether projected boating pressure can be accommodated or not.

An assessment of the physical carrying capacity of an area for all major recreational activities will reveal the main physical constraints associated with the projected increase on levels of recreational use. In certain coastal areas, for particular activities, it will be financially feasible and environmentally acceptable to overcome physical constraints. For example, the construction of a boat ramp in an area which has inadequate boat-launching facilities may be suitable way of overcoming a physical constraint.

*Stage 7: Assess ecological carrying capacity*

While it may be possible to recognise an ecologically degraded environment, the difficulty lies in predicting at what level of recreational use or resource exploitation, unacceptable ecological decline will result. However, by definition, assessment of ecological carrying capacity requires that ecological thresholds be recognised. Although there are methods available for investigating the ecological impacts of outdoor recreation, after-the-fact analyses, the monitoring of environmental change through time and simulation experiments (Wall and Wright, 1977), only the latter method has any predictive ability.

The first two methods are only relevant in situations where development has already proceeded. If it is only possible to recognise that an ecological threshold has been passed when change becomes irreversible, then investigations of this nature are of little practical value (Yapp and Barrow, 1979). While it may be possible to investigate the impact of different levels of recreational use in comparable coastal areas and apply the results to determine the ecological carrying capacity of the area under consideration, the likelihood of finding comparable recreation settings is slim.

Simulation experiments, such as the use of artificial trampers, provide results related to accurate and predetermined measures of use-intensity (Wall and Wright, 1977). These results can be used to determine the appropriate level of walking which will not result in irreversible degradation of the vegetation. However, for most recreational activities pursued at the coast, namely, swimming, boating, watersports and sport angling, this method has limited application.

For certain recreational activities, it may be possible to conduct specific scientific investigations in order to assist in predicting ecological thresholds. For example, in coastal areas where sport angling is popular, one method of obtaining information on current fishing pressure would be to distribute fish-catch cards (see Figure 3) to all sport anglers. Analysis of catch returns would yield information on dominant species and total catches, and catch per unit effort could be calculated. These

SKI-BOAT CATCH RECORD

E.D.P. 12

Locality		Date	
Time. From	To	Club or Association?	
No Anglers in Boat?		Boat Code?	
	Species	No.	Total Kg
	Species	No.	Total Kg
Comments			

results can then be compared with total catch and catch per unit effort data of adjacent coastal areas or with past fishing records, if available. Fisheries biologists should be able to assess whether current fishing pressure is exploitive and whether projected fishing pressure will result in ecological decline or not.

However, since there are no scientifically reliable methods for predicting ecological thresholds, it is suggested that experienced ecologists be asked to determine ecological thresholds based on their intuition and understanding of resilience of different ecological systems. Since group judgements are better than individual judgements (Dalkey, et al., 1972), it is recommended that a group of expert ecologists is consulted and that the Delphi technique (see Pill, 1971) is employed to determine appropriate ecological thresholds for different recreational activities. The Delphi technique is designed to obtain consensus from a group of informed persons on issues or questions that cannot be evaluated in a classical quantitative sense. (For further details on this technique, the reader is referred to Pill, 1971 and Dalkey et al., 1972). The composition of the panel would depend on the nature of the coastal environment under investigation, but in general should consist of a rocky

shore ecologist, a fisheries biologist, an ornithologist, a sedimentologist, an expert on water pollution, a geologist and a botanist.

Once the initial carrying capacity for the different recreational activities has been assessed, major ecological constraints associated with increased recreational pressure will become apparent. In certain situations it may be possible to overcome ecological constraints by restricting access, by limiting use, or by activity zoning. However, in other recreation settings, ecological constraints may impose severe limitations for further recreational development and may result in the rejection of the development application.

*Stage 8: Ascertain acceptable levels of crowding for each activity*

In Stage 8, the aim is to ascertain the level of crowding that will be acceptable to the majority of recreationists. This information can be obtained from questionnaire surveys or structured interviews. For example, in order to ascertain what level of crowding is acceptable to users of a beach, the following question could be asked:

1. (a) Do you think the beach can accommodate more people during peak holiday periods? Please tick ( ) the appropriate box.
- YES ( ) (If "Yes", go to Question 1(b))
- NO ( ) (If "No", go to Question 2)
1. (b) In your opinion, how many more people do you think the beach can support?
- 10% more ( )
- 25% more ( )
- 50% more ( )
- Twice as many ( )
- Three times as many ( )

If the majority of recreationists regard the site as crowded, then the social carrying capacity has been reached.

By assessing the recreationists attitudes towards different levels of crowding for major recreational activities pursued in an area, the social constraints associated with increased recreational pressure will be identified. In certain coastal environments, it may be possible to overcome constraints. For example, if current levels of crowding at a popular boardsailing site are unacceptable to boardsailors, it may be possible to develop new access sites at alternate locations along the coastal area.

*Stage 9: Determine the optimum level of recreational use*

Having systematically evaluated all the recreational activities pursued in an area, identified major physical, ecological and social constraints associated with increased recreational pressure, and considered the feasibility of overcoming these constraints, the final stages in the assessment procedure is to determine the optimum level of recreational use which will not exceed the carrying capacity of the area.

In practice, the appropriate level of recreational use will be defined by those constraints which cannot be overcome, even through planning and management strategies, and thus impose the most severe limitations for further recreational development. It is suggested that where uncertainty exists, conservative use-levels should be adopted, since patterns of recreational use may change over time, participation rates may increase and new recreational activities may emerge.

Resource planners and decision-making authorities should now be able to assess with confidence whether the recreational development proposal should be improved, modified or rejected.

## CONCLUSION

The assessment procedure outlined here attempts to provide a systematic and structured approach for evaluating the recreational carrying capacity of coastal resort areas.

This procedure has been successfully employed in a study undertaken to assess the carrying capacity of the Kromme River Estuary for recreational craft (Sowman and Fuggle, 1987). This paper is presented in Appendix 2 of the dissertation. By following this procedure, it was possible to make predictions about future boating pressure associated with expanding recreational facilities and thus indicate whether the carrying capacity of the estuary would be exceeded or not at this increased level of use.

Although the proposed assessment procedure is presented as a sequence of consecutive stages, it does not have to be rigidly adhered to - additional steps may be inserted, activities may be modified according to the needs of each case, and alternate sources of data may be available. In presenting the methodology, the author recognises that there are inherent weaknesses in the procedure, such as extrapolating recreational statistics (Stages 3 and 4) and basing decisions on value judgments (Stage 8). However, it is hoped that by using this approach in practical decision-making, the methodology may be more fully developed, weaknesses identified and improved, and the assessment procedure refined.

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# COASTAL ENVIRONMENTAL EVALUATION PROCEDURE

## GUIDELINE DOCUMENT 6

### SPACE STANDARDS FOR MAJOR COASTAL RECREATIONAL ACTIVITIES

ACTIVITY	GENERAL STANDARD	LOW DENSITY	HIGH DENSITY
<b>1. BEACH AND SHORE ACTIVITIES:</b>			
1.1 Sunbathing	15m <sup>2</sup> /P	30m <sup>2</sup> /P	10m <sup>2</sup> /P
1.2 Picnicking	150P/ha	60P/ha	250P/ha
1.3 Angling (shore)	30m/P		
<b>2. BOATING ACTIVITIES:</b>			
<i>Small Craft</i>			
2.1: Surfing/Paddleskiing	10P/ha		
2.2 Canoeing	4-6P/ha		
<i>Sail Craft</i>			
2.3 Boardsailing	10P/ha		
2.4 Catamaran Sailing	1-2b/ha		
2.5 Keelboat Cruising	2ha/b		
2.6 Dinghy Sailing	2-4b/ha		
<i>Power Craft</i>			
2.7 Powerboating	8ha/b	15ha/b	3ha/b
2.8 Angling (boat)	2b/ha	1b/ha	4b/ha
2.9 Waterskiing	8-16ha/b		
<b>3. MIXED BOATING ACTIVITIES</b>	2-4ha/b		

**Note 1:**

The space standards listed above for water-based recreation activities are most relevant to estuaries, lagoons and coastal lakes since the water area of the open sea is essentially unlimited.

**Note 2: Explanation of Units**

P - people, m<sup>2</sup> - square metre, b - boat

ha - hectare, m - linear metre of shore

**Note 3:**

Although space standards given above for shore angling, surfing and paddleskiing are quoted in the literature, much higher densities of people result when conditions are good for the activity.

**Note 4:**

Other statistics that should be considered when assessing recreational carrying capacity are:

- (a) In a coastal resort area, approximately 20% of boats are on the water at the same time.
- (b) Approximately 40 - 50% of residents of a coastal resort may be on the beach at the same time.
- (c) Approximately 25 - 30% of people on the beach may be in the water at the same time.

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## CONCLUSIONS

The central concern of this dissertation has been environmental evaluation in the coastal zone. Part 1 considered the theoretical underpinnings of the topic, while Part 2 sought to develop an environmental evaluation procedure which will facilitate the improved conservation and sustainable use and development of coastal resources and areas in South Africa. Recognition of the tremendous environmental, economic and educational value of the coastal zone has prompted most coastal nations, including South Africa, to formulate and implement coastal zone management (CZM)-type programmes. A variety of management strategies are being employed to implement these efforts and achieve the goals of such programmes. Whilst environmental impact assessment (EIA) is recognised as an integral strategy of any CZM - type programme, its use and effectiveness in the context of CZM efforts in South Africa, is extremely limited.

For an environmental evaluation procedure to enhance CZM efforts in a developing country such as South Africa, it was necessary to satisfy certain requirements. The procedure should be:

- appropriate to the socio-political and institutional circumstances;
- holistic, multi-disciplinary and participatory in approach;
- rational, systematic and methodologically sound;
- broadly acceptable;
- supportive of initiatives and policies affecting the coastal zone, and
- cost-effective and practical to implement.

In order to develop a procedure which met these requirements the following objectives were set:

1. to review and assess the use and effectiveness of EIA as a management strategy in CZM-type programmes with a view to resolving areas of weakness,

thus improving its practical application to proposals affecting the South African coastal zone;

2. to assess the status of CZM in South Africa, paying particular attention to the strategies employed to achieve the conservation and sustainable use of resources, identify obstacles to achieving effective CZM and recommend action to improve efforts;
3. to review the evolution, philosophical underpinnings and current status of environmental evaluation in South Africa in order to inform the development of detailed evaluation procedures for coastal proposals;
4. to examine the concept and practice of public participation in the EIA process and explore ways of broadening its scope and making its practice more operational, and
5. based on the above, to develop an environmental evaluation procedure for proposals affecting the coastal zone, which provides a structural framework for undertaking the tasks of EIA, gives guidance on the processes by which these tasks may be accomplished, and provides tools and guidelines to assist with these tasks.

In addressing the first objective, an international review of the use and effectiveness of EIA, as a tool for furthering the aims of CZM was undertaken (Paper 1). This review revealed several problem areas which contribute to its poor performance, especially in developing countries. Of particular relevance to this study were the procedural and methodological weaknesses inherent in the EIA process, which limit its effectiveness in advancing the goals of CZM. The main areas of weakness include:

- inadequate consideration of alternatives;
- unclear and restrictive terms of reference;
- lack of public participation at various stages of the EIA process;
- the use of inappropriate EIA methodologies;
- inadequate methods of impact prediction, significance determination and evaluating cumulative impacts;

- the failure to make uncertainties, methods for incorporating subjective value judgements and decision criteria explicit;
- limited application of conflict-resolution techniques;
- limited monitoring, and
- inadequate practical guidance for undertaking the tasks of EIA.

Other shortcomings which limit EIA's effectiveness as an instrument of environmental, including coastal zone management, were identified. These are:

1. The practice of undertaking EIA as a separate activity rather than as an integral part of the planning process. Integration of environmental considerations and community concerns throughout the planning, assessment and development process will facilitate the assessment and decision-making process and minimise costly delays in project approval.
2. Conducting project-specific EIA's in the absence of broader policies, programmes and plans, which have themselves been developed and assessed in accordance with the principles of EIA, the so-called "tiered" EIA system. The more efficient and cost-effective approach would be to undertake project EIA's within the broader context of coastal area policies and plans which have been informed and shaped by environmental considerations and public concerns.
3. The current emphasis on the production of an environmental impact statement (EIS), rather than on the processes involved in generating and evaluating the information upon which decisions are taken.

The success of applying EIA procedures is further inhibited by short-term changes and instability in the political environment of implementation, a lack of appropriately trained personnel, as well as limited resources, technical competence and data.

A major consideration which influenced the development of the coastal environmental evaluation procedure (CEEP) was the finding that whilst there

appears to be general agreement on the procedural stages and requirements of an EIA system, there is a lack of clarity regarding the ongoing and iterative processes which inform the evaluation and decision-making stages, and which tools and methods are appropriate for the different tasks of EIA.

The second objective concerned an assessment of the status of CZM in South Africa (Paper 2). This assessment revealed that aspects of coastal policy are in place and a variety of strategies are being employed to further CZM efforts. A key shortcoming is the absence of broadly acceptable integrated CZM policies which embrace bio-physical, socio-economic, cultural and historical aspects, and guide management actions. EIA's are undertaken on an ad hoc basis, but in the absence of formal procedures to guide such evaluations, their effectiveness is limited. Thus in the absence of a policy framework and broadly acceptable CZM goals, the effectiveness of environmental evaluation in furthering the goals of CZM, is reduced.

Other obstacles to effective CZM in South Africa are the sectoral approach to resource management adopted by government, the lack of co-ordination and communication amongst those government agencies, institutions and individuals involved in CZM efforts, fragmentation of legislation relevant to CZM, and limited awareness amongst decision-making authorities and the public of the value of coastal resources.

Proposals regarding the institutional arrangements for implementing CZM efforts were as follows: the establishment of a small National Coastal Co-ordinating Unit with policy and programme development and evaluation functions, and the establishment of regional coastal units with regulatory and EIA functions.

The promulgation of a consolidated CZM Act would streamline the plethora of ad hoc legislation currently relevant to CZM and help focus administrative responsibilities amongst the multitude of authorities involved in CZM. It was recognised that in order to obtain the commitment of politicians and support of the

public to CZM efforts, it would be necessary to educate and empower the public, thereby facilitating their improved involvement in the various activities of CZM.

A review of the historical development, philosophical underpinnings and current status of environmental evaluation and CZM in South Africa was the focus of the third objective (Paper 3). This was necessary to ensure that the development of the CEEP would be consistent with, and enhance, existing efforts in this field. There is at present no legal requirement that environmental evaluations be undertaken for proposals which may significantly affect the environment. However, as recently as 1992, a systematic procedure for ensuring that the environmental consequences of proposals (including policies, programmes, plans and projects) be investigated and adequately considered in the planning and decision-making process was developed and published. This generic procedure, termed Integrated Environmental Management (IEM), is mainly concerned with reconciling conflicting interests and identifying environmentally appropriate alternatives to meet the stated need rather than focusing on the negative impacts associated with projects.

There are certain characteristic features which distinguish IEM from other EIA procedures and suggest an improvement in the state of the art in developing countries. These are:

- the integration of EIA into the planning process and the emphasis on an environmental planning process which incorporates environmental and community concerns throughout all stages of the process;
- the involvement of the public and relevant authorities from the initial stages of planning and throughout all subsequent stages;
- the encouragement of economic development through the identification of environmentally and socially acceptable alternatives to meet a stated need;
- the requirement not only to mitigate negative impacts but also to enhance positive impacts;
- the use of comprehensive but simple aids, such as checklists and guidelines to assist with the tasks of IEM, and

- emphasis on accomplishing adequate and broadly acceptable scoping procedures.

The refinement and further development of more detailed procedures and guidelines for *specific activities* such as the construction of roads or resorts, or for activities in *particular environments* such as the coastal zone, were identified as the next stage in the development of environmental evaluation in South Africa. Given the increasing pressure on, and degradation of, the South African coastal environment, the development of detailed procedures for evaluating proposals affecting the coastal zone was considered a priority.

However, for the proposed CEEP to be acceptable and of practical value it would have to be consistent with the principles and procedures of the overall generic framework, build on its strengths, address weaknesses and incorporate existing strategies employed to manage coastal resources and areas.

A common theme to emerge from these three review papers was the need for increased public participation in policy and programme formulation and in the strategies employed to implement policies. An improved understanding of the public involvement process and improved methods for facilitating that involvement in all stages of the EIA process, was thus identified as an area of EIA requiring development.

Objective 4 was therefore concerned with examining the concept and practice of public participation internationally, and in South Africa, and suggesting ways of broadening its scope and improving its practice in the EIA process (Paper 4). Making public participation operational in activities and decisions which affect people's lives is particularly pertinent in the light of socio-political changes occurring in South Africa at present. Personal experience and insights gained from undertaking the public participation aspect of several EIA's in South Africa also provided ideas for the proposed public participation process.

A process for public participation which parallels the environmental planning process was consequently developed. It provides guidance on how to determine the nature and extent of public involvement, what tasks the public should be involved in at each stage of the EIA process, and presents a suite of methods available to facilitate such a participatory process. An indication of the capabilities of the various methods, in terms of certain evaluation criteria, is also provided.

In the South African context, the active involvement of disadvantaged communities in the public participation process represents a major challenge. Our understanding of factors inhibiting effective participation and our experience of participatory planning with disadvantaged communities is extremely limited. An examination of the public participation process implemented in a development project affecting informal communities in the coastal residential area of Hout Bay, Cape, provided insights into the obstacles for achieving effective participation in such communities (Paper 5). The author's research involvement in the Hout Bay disadvantaged communities necessitated the application and evaluation of various approaches to, and methods of, public participation. This first hand experience provided ideas on how to overcome certain obstacles and improve the involvement of such communities in the EIA process.

Firstly, access to the community should be obtained by approaching elected representatives or service organisations working in the community. Involving the community in identifying an appropriate participation process as well as suitable methods of participation is key to a successful outcome of such a programme.

Many of the problems identified also suggest that professionals and authorities need to adopt a different attitude and approach to planning and development where disadvantaged communities are involved. Professionals need to be made aware of the benefits of involving interested and affected parties throughout the planning, assessment and decision-making process. Active participation can only be achieved if affected communities are involved from the inception of plan formulation; it cannot be achieved if options have already been predetermined. Thus, mechanisms for

involving interested and affected parties which are acceptable to all must be set in place at the early stages of project planning. Furthermore, all interested parties, or representatives of such parties, must identify and agree on the process that should be followed to undertake planning, evaluation and decision-making.

Few planning professionals have the skills to adequately address the social components of such projects and facilitate the public participation process. The involvement of professionals in the social sciences with the necessary skills to facilitate the desired level of participation is required. Thus, the need for a multi-disciplinary approach is stressed. This will require a commitment from the professional team and authorities to allocate more time, effort and resources to the public involvement aspect of the EIA process.

The reviews, investigations and experience gained from undertaking EIA's and participatory research provided the background and insights necessary to develop the CEEP. The final objective of this dissertation was thus to develop an environmental evaluation procedure for proposals affecting the coastal zone, which provides a framework for undertaking the tasks of EIA, gives guidance on the processes by which these tasks may be accomplished and provides tools and guidelines to assist with implementing these tasks (Paper 6).

The general attributes of the CEEP procedure considered appropriate for the South African context were that the procedure be:

- consistent with the principles and procedures of IEM;
- holistic and multi-disciplinary in nature;
- systematic and structured;
- participatory, involving authorities and affected parties throughout the evaluation process, and
- process rather than product orientated.

Furthermore its focus should be on:

- identifying reasonable alternatives;

- identifying significant impacts, community concerns and priorities;
- incorporating and building upon the various strategies employed to manage coastal resources;
- marrying expert opinion and local experiential knowledge;
- employing group judgement to reflect the wishes and values of society;
- specifying the nature of predictions and the basis upon which they were made;
- making explicit areas of uncertainty, methods for incorporating subjective value judgements and clarifying decision criteria, and
- identifying the alternative which meets the stated need and results in the greatest environmental and social benefits to society.

The procedural requirements of the CEEP are summarised in Figure 3 in Paper 6. The CEEP incorporates the key elements of most EIA systems, embraces the principles and general procedures of IEM, builds upon its strengths and develops and improves those areas not dealt with explicitly and comprehensively. Its main contribution in the field of EIA has been to provide a systematic and comprehensive procedure for undertaking environmental evaluations of township, resort and recreation-related developments affecting the coastal zone, to clarify the ongoing and iterative processes which characterise the procedure and to develop a variety of tools, including six practical guideline documents to assist in these tasks.

In particular, the stages of screening, scoping, predicting impacts, assigning significance, clarifying trade-offs amongst alternatives, and selecting a preferred alternative, have been fleshed out. The emphasis is on identifying and sustaining processes which are acceptable to all parties and appropriate to the tasks at hand. It recognises the subjective nature of decisions taken at each stage of the procedure, and acknowledges that incorporating subjective value judgements is integral to reaching decisions which reflect the wishes and values of society. The only requirement is that the methods of incorporating subjective judgements and the criteria employed for decision-making be made explicit.

In general the CEEP proposes clear and simple methods for impact prediction, assessment and evaluation. It encourages the use of expert opinion and local experiential knowledge in predicting impacts and a group evaluation method to assign significance and evaluate alternatives. Two approaches to assigning significance and making trade-offs amongst alternatives are proposed. Both approaches rely on the collective judgements of a group of people elected to represent the values of society. The first approach requires the group, through a process of review, discussion and clarification, to collectively agree on significant impacts. Information generated from this process is presented in a qualitative and semi-aggregated fashion. The second approach, termed the Significance Measurement Technique, is a systematic process for assigning significance in which the subjective value judgements are made explicit using numerical terms. The choice of approaches should be guided by scoping, as well as the characteristics of elected group members and the cultural diversity of groups.

To facilitate the evaluation of alternatives a simple trade-off exercise is proposed. It poses questions designed to systematically compare significant, residual, negative impacts and optimised, positive impacts associated with each alternative, to every other alternative, leading to the identification of the socially superior option. In order to increase the confidence in this trade-off process, it is suggested that three final evaluation criteria, those of efficiency, equity and sustainability, be employed to confirm the selection of the preferred alternative. The final stages of the evaluation procedure are consistent with IEM procedures which conform with the standard requirements of most EIA systems.

In view of the political restructuring occurring in South Africa, and the uncertainties regarding the institutional framework for environmental and coastal management, proposals for the institutional arrangements to support the CEEP are preliminary. The emphasis has been on developing a theoretically sound and broadly acceptable procedure which could be applied under a variety of institutional conditions.

In terms of the objectives and requirements of an EIA system, at a theoretical level, the proposed CEEP is considered to be sound and adequate. It is submitted that CEEP advances the state of the art by addressing key weaknesses inherent in most EIA systems in developing countries. Furthermore, it has attempted to unpack and clarify the EIA concept and its component parts by identifying its underlying principles and distinguishing between the procedural stages of EIA and those ongoing and iterative processes which characterise it. In particular, suggestions for making operational the processes of scoping, public participation and evaluation are made.

The CEEP, together with the various tools and guidelines described in this dissertation, provides an overall package for undertaking environmental evaluations of any proposals affecting the coastal environment, which is cost-effective and easy to apply in terms of available resources, expertise and data in a developing country such as South Africa. Although not fully tested, it is believed that the implementation of CEEP will be cost-effective since the proponent (or his/her consultant) will be able to draw on the knowledge, insights and value judgements of the scoping participants as well as make use of the extensive tools and practical guidelines that have been developed. It is envisaged that expert input will mainly be required for predictive analyses and the technical tasks of planning and design.

Nevertheless, since the CEEP has not been fully applied in practice, it is not possible to evaluate its utility and effectiveness. This represents a weakness in the dissertation. The parallel development of IEM during the development of the CEEP, political changes as well as time and financial constraints prohibited this. The next stage in the development of this procedure should be testing its practical application as an integrated procedure and not step by step as undertaken in its development.

It is submitted that for any environmental evaluation procedure to achieve the objectives set for it, and serve the goals of CZM, there needs to be a change in attitude amongst professionals, authorities and the public. This changing attitude would require a commitment by the proponent, authorities and the affected public

to the principles underpinning environmental evaluation, and their active participation in the processes driving it. It would also require improved awareness of the value of coastal resources and areas, and a recognition of the need to implement coordinated strategies to ensure its sustained use and development. This is necessary since the requirement for mandatory environmental evaluations may result in them being undertaken, but cannot ensure that proponents fully embrace and comply with the identified principles and procedures, or set in place the processes which underly the spirit and intention of environmental evaluation.

Whilst embracing these principles and procedures cannot ensure environmentally sound planning and decision-making, it requires that the issues and alternatives be identified, and that uncertainties, trade-offs and subjective value judgements be made explicit and brought into the public arena. Under these circumstances, it becomes more difficult for professionals and decision-makers to ignore environmental and community concerns, and thus promotes informed decision-making and accountability for decisions taken.

It is concluded that the employment of the procedure, developed in this dissertation, to all proposals affecting the coastal zone and the establishment of the proposed institutional mechanisms for its implementation, will reduce coastal degradation, streamline and enhance existing coastal management efforts, and give direction to the further development and implementation of an Integrated Coastal Zone Management programme for South Africa.

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Ms D Wilson, Peninsula Mountain Forum, Cape Town, July 1993.

## LIST OF ACRONYMS

ANC	African National Congress
CAMPNET	Coastal Area Management and Planning Network
CCD	Coastal Conservation Department
CCMS	Committee for Coastal and Marine Systems
CEEP	Coastal Environmental Evaluation Procedure
CMAP	Coastal Management Advisory Programme
CPA	Cape Provincial Administration
CSIR	Council for Scientific and Industrial Research
COAST	Coastal Action Strategy
CZM	Coastal Zone Management
DEA	Department of Environmental Affairs
DEER	Draft Environmental Evaluation Report
EIA	Environmental Impact Assessment
EEASA	Environmental Education Association of Southern Africa
EEC	European Economic Community
EEU	Environmental Evaluation Unit
EMPR	Environmental Management Programme Report
EPPIC	Environmental Planning Professions Inter-Disciplinary Committee
FEARO	Federal Environment Assessment Review Office
FEER	Final Environmental Evaluation Report
GIS	Geographical Information Systems
I&AP's	Interested and Affected Parties
ICC	International Chamber of Commerce
ICZM	Integrated Coastal Management
IEM	Integrated Environmental Management
IUCN	World Conservation Union
LDA	Limited Development Areas
MARPOL Act	International Convention for the Prevention of Pollution from Ships Act 2 of 1986

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NEAC	National Environmental Awareness Campaign
NEB	National Environment Board
NEPA	National Environmental Policy Act
NGO	Non-governmental Organisation
NGT	Nominal Group Technique
OECD	Organisation for Economic Co-operation and Development
PACOPASOA	Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981
PEM	Panel Evaluation Method
SANCOR	South African Network of Coastal and Oceanic Research
SATOUR	South African Tourism Board
SMT	Significance Measurement Technique
SFRI	Sea Fisheries Research Institute
TAN	Technical Advice Notes
UCT	University of Cape Town
UNEP	United Nations Environment Programme
WCRSC	Western Cape Regional Services Council
WWF	World Wildlife Fund

APPENDIX 1

LISTED ACTIVITIES AND LISTED ENVIRONMENTS

# APPENDIX 1: LISTED ACTIVITIES\*

*Listed Activities* refer to the planning and development of the following:

**1. Policy and planning proposals:**

- a) Structure plans (or, in the absence thereof, town planning schemes and zoning schemes).
- b) Guide plans.
- c) Rezoning applications.
- d) Subdivisions.
- e) Land acquisition for national parks, nature reserves, marine reserves, protected natural environments or wilderness areas.
- f) Establishment of townships.
- g) Declaration of limited development areas.
- h) Any government policy on the use of natural resources which is not covered by physical planning legislation.

**2. Nuclear installations.**

**3. The formal disposal of waste.**

**4. The transportation of hazardous substances and radio-active waste.**

**5. Mining, mineral extraction and mineral beneficiation.**

**6. Energy industry:**

- a) Power generation facilities with an output of 1 megawatt or more.
- b) Electrical substations and transmission lines having equipment with an operating voltage in excess of 30 000 volts r.m.s. phase-to-phase.

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\* The author was a member of the research team which compiled these lists for the Integrated Environmental Management Procedure (DEA,1992).

**7. Storage facilities:**

- a) Storage facilities for chemical products.
- b) Industrial installation for the bulk storage of fuels.
- c) Bulk distribution facilities.

**8. Industry:**

- a) Scheduled Processes under Schedule 2 of the Atmospheric Pollution Prevention Act (45/1965).
- b) Industries requiring a permit under section 12 of the Water Act (54/1956).
- c) Manufacture of explosives.

**9. Agricultural and forestry activities:**

- a) Control Measures under section 6 of the Conservation of Agricultural Resources Act (43/1983).
- b) Battery and feedlot farming installations.
- c) Propagation of invasive alien plant and animal species.
- d) Afforestation projects.

**10. Infrastructure:**

- a) Major roads.
- b) Railways.
- c) Commercial aerodromes.
- d) Ports, harbours and marinas.
- e) Major pipelines.
- f) Cable-ways and cable-way stations.
- g) Television and radio transmission masts.
- h) Permanent racing and test tracks for cars and motor cycles.
- i) Major canals, aqueducts, river diversions and water transfers.
- j) Permanent flood-control schemes.
- k) Major dams, reservoirs, levies and weirs.
- l) Buildings with a total floor space of 500 square metres or more.
- m) Public transport mode transfer facilities.

11. Establishment of armaments testing areas.
12. Reclamation of land from the sea.

## LISTED ENVIRONMENTS

The areas or features listed below are classified as *Listed Environments*.

### A. Designated Areas or Features:

1. Physical planning control areas.
2. Limited development areas.
3. Protected natural environments.
4. National, provincial and municipal nature reserves.
5. Private nature reserves.
6. Mountain catchment areas.
7. Wilderness areas.
8. National monuments.
9. Shipwrecks.
10. Archaeological and palaeontological sites.
11. Graves and burial sites.
12. National gardens of remembrance.
13. Conservation areas.
14. Meteorites.
15. Off-shore islands.
16. Inter-tidal zone.
17. Admiralty reserve.
18. Lake areas.
19. National heritage sites.
20. Sites of conservation significance.
21. Estuaries and lagoons.
22. Streams and rivers channels, and their banks.
23. Floodplains.
24. Wetlands.

25. Lakes.
26. Dunes.
27. Beaches.
28. Reefs.
29. Indigenous forests.
30. High potential agricultural land.
31. Caves.
32. Green belts or public open space in municipal areas.

**B. Demarcated Areas or Features:**

33. Architectural precincts.
34. Buildings.
35. Battle sites.
36. Burial sites.
37. Immovable property.
38. Landscapes.
39. Islands in rivers.
40. Biotic assemblages and communities.
41. Habitat of Red Data Book species.
42. Bird migration sites.
43. Aquifers and aquifer-recharge areas.
44. Areas with a high natural water table.
45. Damaged land.
46. Unstable soils.
47. Natural resource areas (including minerals).
48. Sites of geological significance.
49. Geologically- and geotechnically-unstable areas.
50. Areas or sites of outstanding natural beauty.
51. Scenic drives and panoramic views.
52. Areas or sites of special scientific interest.
53. Areas or sites of religious or spiritual significance.
54. Areas or sites of special social, cultural or historical interest.
55. State land.

## APPENDIX 2

ASSESSING RECREATIONAL CARRYING CAPACITY:  
A CASE STUDY OF THE KROMME RIVER ESTUARY,  
SOUTH AFRICA

## **Assessing Recreational Carrying Capacity: A Case Study of the Kromme River Estuary, South Africa**

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### *ABSTRACT*

*Demand for property for residential and recreational development in the coastal zone is increasing annually in South Africa. Traditionally, development of property adjacent to estuaries has been based on demand and supply of suitable shoreline. Little attention has been given to the capacity of the water surface to accommodate recreational activities generated by shore development.*

*The assessment of recreational carrying capacity of a waterbody is considered a necessary input for determining the amount of property development that should be permitted on land adjacent to estuaries. This paper provides a procedure for assessing carrying capacity, which is then employed to determine the nature and scale of shore development that will lead to appropriate levels of recreational boating pressure on the Kromme River estuary. Recommendations for regulating current and projected water-based recreational activities to prevent overcrowding are made.*

### **1. INTRODUCTION**

In South Africa, as in many other Western societies, the ownership of second homes for leisure use is common amongst the more affluent sectors of the population. Demand for property adjacent to estuaries is especially high because of the aesthetic qualities of the estuarine environment and the diversity of recreational opportunities afforded by these sheltered and productive systems. It is understandable, therefore,

that holiday cottages, resorts and towns have developed around several estuaries in South Africa.<sup>1</sup>

The demand for choice shoreline property has frequently resulted in uncoordinated and poorly planned development of land adjacent to estuaries, with concomitant over-use and overcrowding of recreation resources, especially during peak holiday periods. The capacity of the water surface to accommodate recreational pressure generated by shore development is seldom incorporated into the planning and decision making related to the expansion of activities around estuaries. It is the authors' view that an assessment of the carrying capacity of the area of water available for recreation should play a fundamental role in determining the nature and scale of shoreline development.

This principle has been used for estimating the number of cottages that may be planned for development around lakes in Canada<sup>2,3</sup> and can equally be applied to planning of development activities in an estuarine environment. In this paper, the concept of recreational carrying capacity provides the theoretical framework for assessing the level of shoreline development that will lead to appropriate levels of boating pressure on a South African estuary. It is our contention that the use of the carrying capacity concept will prevent over-development, overcrowding and the deterioration of environmental quality and recreational potential of an area. Furthermore, the concept allows identification of 'saturated' areas where recreational carrying capacity is already exceeded.

## 2. THE STUDY AREA

The Kromme River estuary is situated on the Cape southeast coast approximately 55 km west of Port Elizabeth (Fig. 1). The Kromme estuary is one of the relatively few unspoilt estuaries in the Eastern Cape,<sup>4</sup> with no industrial development along its banks and no harbour facilities or structures in the vicinity of the mouth. The outstanding qualities of the natural environment and the high potential for recreational opportunities afforded by the Kromme River estuary and adjacent coastal waters of St Francis Bay have resulted in the development of holiday cottages and residential homes in the area.

On the south bank of the river, near the mouth, a prestigious marina canal system, Marina Glades, has been developed. Research by Baird *et al.*<sup>4</sup> has shown that the development of the marina has had no adverse effects on the ecology of the Kromme estuary.

Property developers, speculators and potential home-owners have

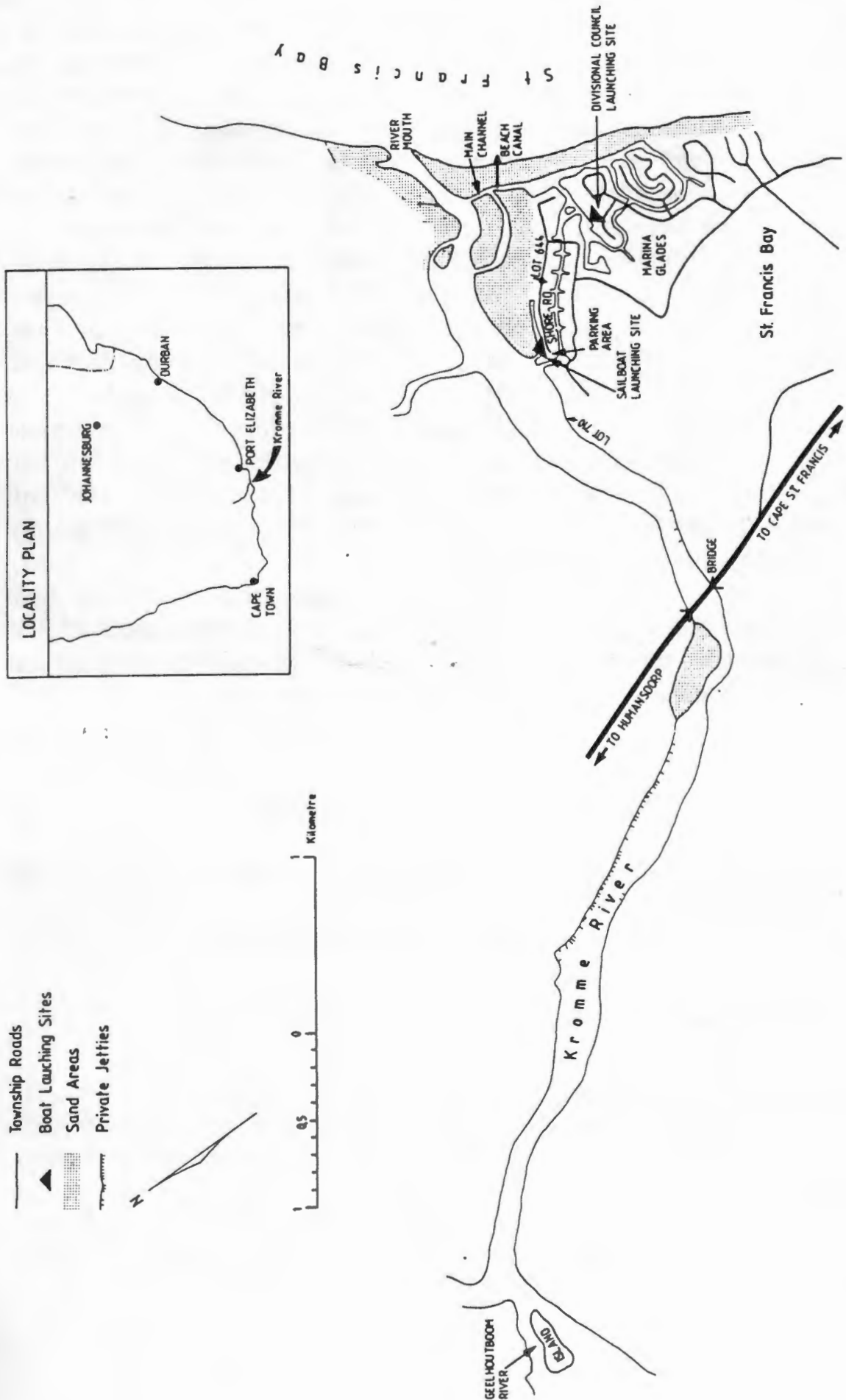


Fig. 1. Location of the Kromme River estuary.

recognized the potential of the area and consequently several applications to develop property along the Kromme River are being received annually by the local authority. Recently, a proposal to develop facilities for commercial fishing boats in the Kromme River estuary was submitted to the administrative authorities. Concern was expressed by property owners, local authorities and environmental conservation groups that, with increased development in and adjacent to the estuary, future overcrowding of recreational resources and boating congestion on the estuary would result. This would lead to a deterioration of the qualities which have attracted property owners and holidaymakers.

The local authority recognized the need to assess the carrying capacity of the estuary for recreational boating before approving further development in the area and consequently commissioned the Environmental Evaluation Unit of the University of Cape Town to undertake the investigation upon which this case study is based.

As development is concentrated near the mouth of the estuary, most aquatic recreation activities take place between the river mouth and the island where the Geelhoutboom River joins the estuary (Fig. 1). The recreational carrying capacity of this area of water (approximately 125 ha) is the subject of this study.

In this article the St Francis Bay village, the Marina Glades development and the holiday cottages situated on the banks of the estuary between the mouth and the Geelhoutboom River (Fig. 1) are collectively referred to as the St Francis/Kromme area.

### 3. METHODS OF DATA COLLECTION

Field investigations were undertaken during the Christmas/New Year peak summer holiday period. This period was chosen so that a good indication of maximum recreational pressure could be obtained.

#### 3.1. Questionnaire survey

Questionnaires were hand-delivered to all households in the St Francis/Kromme area from 28 December 1985 to 4 January 1986. Respondents were requested to return the completed questionnaire to the researcher by post in a stamped envelope provided.

A total of 478 questionnaires were distributed and, by 3 February 1986, 333 had been returned. This represents a response rate of 70% which is considered very good for a survey of this nature.

### **3.2. Direct observations**

During the 7-day field survey, hourly observations from 8.00 to 18.00 h were made of recreational activities pursued on the area of water under investigation. These observations were made from three vantage points along the estuary, and recorded on field data sheets. The results obtained from these field observations are discussed in Section 6 of this paper.

## **4. DEFINING RECREATIONAL CARRYING CAPACITY**

Although the concept of carrying capacity has been widely used in outdoor recreation planning and resources management, there is still no standard procedure for assessing it.<sup>2</sup> Nevertheless, all definitions of recreational carrying capacity have two main elements: maintenance of the integrity of the resource base and provision of a recreation experience of high quality.

A recent review of the concept of recreational carrying capacity has been published by Pigram.<sup>5</sup> His interpretation of the concept is based on the ideas expounded by the United Kingdom Countryside Commission. This Commission defines recreational carrying capacity as:

The level of recreation use an area can sustain without an unacceptable degree of deterioration of the character and quality of the resource or of the recreation experience.

This broad definition has been further refined and four separate categories of carrying capacity are identified. These are: physical carrying capacity; economic carrying capacity; ecological carrying capacity; and social carrying capacity. For the purpose of this study three categories and their definitions are applicable.

### **4.1. Physical carrying capacity**

Physical carrying capacity is concerned with the maximum number of 'use units' (people, vehicles, boats) which can be physically accommodated in an area. It is a design concept, as when referring to the capacity of a car park, a spectator stand or a theatre.<sup>5</sup>

Capacity figures for amenities such as car parks can easily be calculated since the area under consideration has finite physical limits. Determining the physical carrying capacity of the water surface of an estuary for boating activities becomes much more complicated. The

physical carrying capacity of the water surface cannot simply be determined by calculating the number and size of craft that can be accommodated on a defined area of water but must include an assessment of the space requirements for different boating activities.

Consideration of safety is also necessary. Although figures for safe boat-densities have been derived and are frequently quoted in the recreation literature,<sup>2,6-8</sup> the criteria for determining these figures are seldom explicit. In general, it would appear that these theoretical boat-densities are based on what past research has shown to be generally accepted standards for safe boating.<sup>2</sup>

For recreation activities such as boating, an assessment of the capacity of related shore facilities such as car parks, trailer parks and boat ramps also contributes to determining the physical carrying capacity of the recreation area. In most recreational settings, facilities capacity can usually be enlarged if the necessary finance is made available.

According to Herbelein,<sup>9</sup> the upper limit of capacity is the amount of physical space available for recreational use. In this study, the upper limit of capacity is the amount of space required to ensure recreational activities are at a safe and efficient density. Thus determination of physical carrying capacity serves as a starting point for assessment of recreational carrying capacity.

## 4.2. Ecological carrying capacity

Ecological carrying capacity is concerned with the maximum level of recreational use, in terms of numbers and activities, that can be accommodated by an area or an ecosystem before an unacceptable or irreversible decline in ecological values occurs.<sup>5</sup>

The difficulty with this definition is deciding what constitutes an unacceptable change or irreversible decline in ecological integrity and upon what parameters this value judgement should be based. In addition, there are problems associated with monitoring environmental change caused by recreation activities. The major problem is controlling the variables under investigation: the complex interaction of components in an ecosystem cannot easily be separated. The dynamic fluctuating nature of ecosystem processes also makes it difficult to define a base level against which to measure man-induced change. Recreation activity is also variable, since levels and intensity of recreational use are not uniform. Also, most recreational sites have

different boundaries to existing ecosystems, thus adding to the difficulty of making an integrated functional analysis.

In the absence of scientifically reliable methods for predicting ecological thresholds, experienced ecologists use their intuition and understanding of the resilience of different ecosystems to determine ecological thresholds and to identify areas where uncertainty exists and where conservative recreation use levels should be adopted.

### **4.3. Social carrying capacity**

Social carrying capacity is concerned with the visitor's perception of the presence (or absence) of others simultaneously utilizing the resources of an area. This concept is concerned with the effect of crowding on the enjoyment and appreciation of the recreation site. Social carrying capacity is:

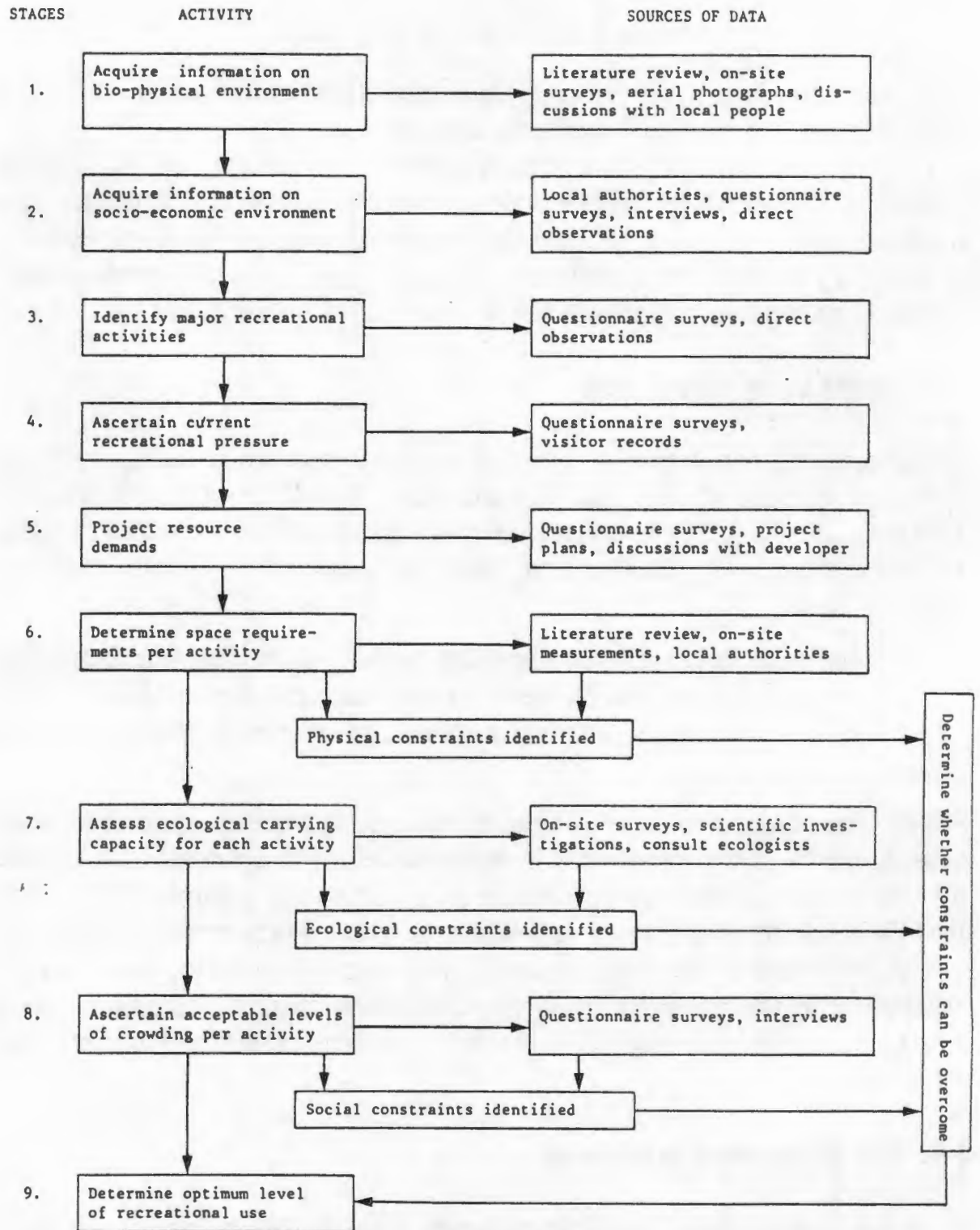
the maximum level of recreational use, in terms of numbers and activities, above which there is a decline in the quality of the recreation experience from the point of view of the recreation participant.<sup>5</sup>

Public opinion provides valuable insight into people's perception of what constitutes a recreational experience of good quality. In different recreation settings and for different socio-economic groups the level of crowding which is tolerated is known to vary. Such input can greatly assist decision makers in determining the level of crowding that will be acceptable to the majority of users. Questionnaires, public surveys and interviews are the methods available to the researcher to obtain this information.

### **4.4. The assessment procedure**

From the above, it is clear that no single number exists that defines the recreational carrying capacity of an area. Rather, combinations of factors, including an assessment of the spatial requirements of the activity, the resilience of the ecosystem to different kinds and levels of use, and the attitudes of the recreationists to different levels of crowding, must all be considered when determining the recreational carrying capacity of given area.

An outline of the assessment procedure followed in this study is presented diagrammatically in Fig. 2. The procedure seeks to acquire pertinent information, ascertain current recreational pressure, project resource demands, and assess physical, ecological and social carrying



**Fig. 2.** Procedure for assessing recreational carrying capacity.

capacity of the area for major recreational activities. Constraints associated with further development are identified, and finally the appropriate level of recreational use for the area is determined. A detailed description of the assessment procedure and comments on problems related to its practical implementation have been given by Sowman.<sup>10</sup>

## 5. CURRENT AND PROJECTED RECREATIONAL PRESSURE IN THE ST FRANCIS/KROMME AREA

### 5.1. Current recreational pressure

To ascertain the current recreational pressure imposed on the St Francis/Kromme area during peak holiday periods, data on seasonal population pressure, participation rates per activity and numbers of recreational craft must be obtained. These data were derived from questionnaire analysis.

#### 5.1.1. *Seasonal population pressure*

Analysis of the questionnaires showed that 20% of respondents were permanent residents of the St Francis/Kromme area, 76% were regular visitors, while only 4% were visiting the area for the first time. The majority of respondents (92%) indicated that they usually visit the area during the Christmas/New Year holiday season, while the remaining 8% only occasionally visited at this time.

Annually, from approximately 15 December until 10 January (depending on the dates of school holidays), the population of the St Francis/Kromme area increases dramatically, causing a population influx into the area of between 2800 and 3000 people. This represents an increase of approximately 400% above permanent population numbers.

An estimate of the total population present in the area during the survey period was obtained in the following way. From questionnaire analysis, the average number of people per household was calculated to be 6.6. This figure agrees favourably with a similar value (6.9) for surveys conducted at the coastal towns of Infanta and Whitesands, Cape South Coast.<sup>11</sup> Since one questionnaire was handed out to each household in the St Francis/Kromme area, totalling 478, the total population in the area during the survey period was calculated as  $478 \times 6.6 = 3155$  people (Table 1).

#### 5.1.2. *Participation rates per activity*

In the questionnaire survey, respondents were asked to indicate how many persons participated in a variety of listed recreational activities on the Kromme River estuary. Estimates of total numbers of participants for each activity were then made by proportional calculation. For example, the questionnaire survey revealed that 949 out of 2198 respondents participated in powerboating (Table 1, column 1). Thus, by proportional calculation, the actual number of people participating in

TABLE 1

A Summary of Current and Projected Population Numbers and Participation Rates per Recreation Activity in the St Francis/Kromme Area during Peak Holiday Periods

Activity	Population numbers	Number of participants			
		Questionnaire respondents 2198	Current estimate 3155	Projected	
				Low estimate 4085	High estimate 8950
Powerboating		949	1 362	1 764	3 864
Waterskiing		582	835	1 082	2 370
Boardsailing		638	916	1 186	2 598
Hobie cat sailing		99	142	184	403
Other dinghy sailing		249	357	463	1 014
Rowing/canoeing		345	495	641	1 405
Paddleskiing		360	517	669	1 466
Fishing from boat		642	922	1 193	2 614
Fishing from shore		565	811	1 050	2 301
Collecting bait		550	789	1 022	2 240
Swimming		1 620	2 325	3 011	6 597
Sunbathing		1 499	2 152	2 786	6 104
Birdwatching		250	359	465	1 018
Picnicking/braaing (barbecueing)		372	534	691	1 515

powerboating during the survey period was calculated to be 1362 (Table 1, column 2). Current participation rates for all recreational activities listed in the questionnaire were estimated in this manner (Table 1, column 2). Throughout the remainder of this paper, these figures are referred to as the 'current estimate' of recreational pressure in the study area.

### 5.1.3. Numbers of recreational craft

Current estimates for numbers of recreational craft present in the study area during the survey period were also made by proportional calculation, based on figures obtained from questionnaire analysis. These figures appear in Table 2, column 2.

## 5.2. Projected recreational pressure

In the St Francis/Kromme area, only 46% of building sites are at present developed. Thus, projections of future population numbers, participation rates per activity, and numbers of recreational craft

TABLE 2

A Summary of Current and Projected Numbers of Recreational Craft Utilizing the Kromme River Estuary During Peak Holiday Periods

Recreational craft	Population numbers	Number of recreational craft			
		Questionnaire respondents 2198	Current estimate 3155	Projected	
				Low estimate 4085	High estimate 8950
Sailboards		355	510	660	1 446
Hobie cats		36	52	67	147
Other sailing craft		92	132	171	375
Powerboats		321	460	597	1 307
Rubber inflatables		15	22	28	61
Canoes		139	200	258	566
Paddleskis		192	276	357	782
Rowing boats		42	60	78	171

expected in the area at increased levels of development have been made.

As only 478 of the 619 houses were occupied during the survey period, a projected low estimate of potential recreational pressure in the area can be calculated on the basis of the current average (6.6) occupancy per household. Thus, the potential population that could be present in the area during a peak holiday period—the 'projected low estimate'—is  $619 \times 6.6 = 4085$  people (Table 1, column 3).

From these higher estimated population numbers (4085), data on participation rates per activity, together with numbers of recreational craft which may be anticipated, have been calculated (Tables 1 and 2, column 3).

A 'projected high estimate' for recreational pressure has been calculated from population numbers which may be anticipated in the study area assuming that all 1356 building sites in the St Francis/Kromme area will eventually be developed and occupied by the present average of 6.6 individuals per residential site. Column 4 of Table 1 lists participation rates per activity, and column 4 of Table 2 gives numbers of recreational craft anticipated in the area at this increased level of development.

When assessing the recreational carrying capacity of the Kromme River estuary for recreational craft, reference will be made to these different estimates of recreational pressure, i.e. current, projected low and projected high.

## 6. FACTORS CONTROLLING BOATING PRESSURE

Data from hourly observations made over the 7-day field survey period were summarized from daily record sheets, and an example of the results obtained from 1 day's observations is presented in Fig. 3. Data on recreational craft utilizing the estuary were divided into two broad categories: power craft, which included all power-driven boats engaged in aquatic activities; and sailing craft, which included all classes of sailing dinghies, hobie cats and sailboards.

As boating activity is generally weather-dependent, weather observations were also made. Wind data for the observation period were obtained from the Cape St Francis lighthouse. The prevailing winds in the St Francis/Kromme area are from the southwest<sup>12</sup> although easterly winds are predominant during the summer months. Sailing dinghies and hobie cats are less restricted by wind direction than sailboards, but as sailboards account for 73% of all sailing craft present in the area (Table 2, column 2), most sailing activities on the estuary take place at right angles to the wind, i.e. across the width of the estuary from one bank to the other.

Sailing activities on the Kromme River estuary are also restricted by tidal conditions. Hobie cats require at least 1 m of water for safe sailing, while sailboards need approximately 60 cm of water. Since the water is too shallow for safe and enjoyable sailing over sections of the estuary at low tide, sailing activity increases during the high tide period.

Results from daily observations indicate that optimum conditions for sailing on the Kromme River are at high tide when wind strengths are between 15 and 25 knots. Very few sailboats utilize the estuary when wind strengths exceed 30 knots.

Powerboating, on the other hand, is not as dependent on tidal conditions as sailing activities. Most powerboat traffic is orientated up and down the river and because of increased manoeuvrability these boats can navigate through deeper channels and so avoid sand banks and shallow water areas. However, strong winds restrict certain powerboating activities. Results from hourly observations indicate that when the wind strength exceeds 25 knots the number of powerboats on the water decreases. For activities such as waterskiing and sport angling, winds over 15 knots are unsuitable. Thus boat densities on the estuary are highest during high tide conditions when the wind strength is between 10 and 20 knots.

Not all recreational craft present in the area will be on the water at the same time. Studies by Jaakson<sup>3</sup> in Ontario and Threinen<sup>13</sup> in Wisconsin have shown that at any one time, on an optimum day, approximately 10% of all boats present in the area will be in use. These

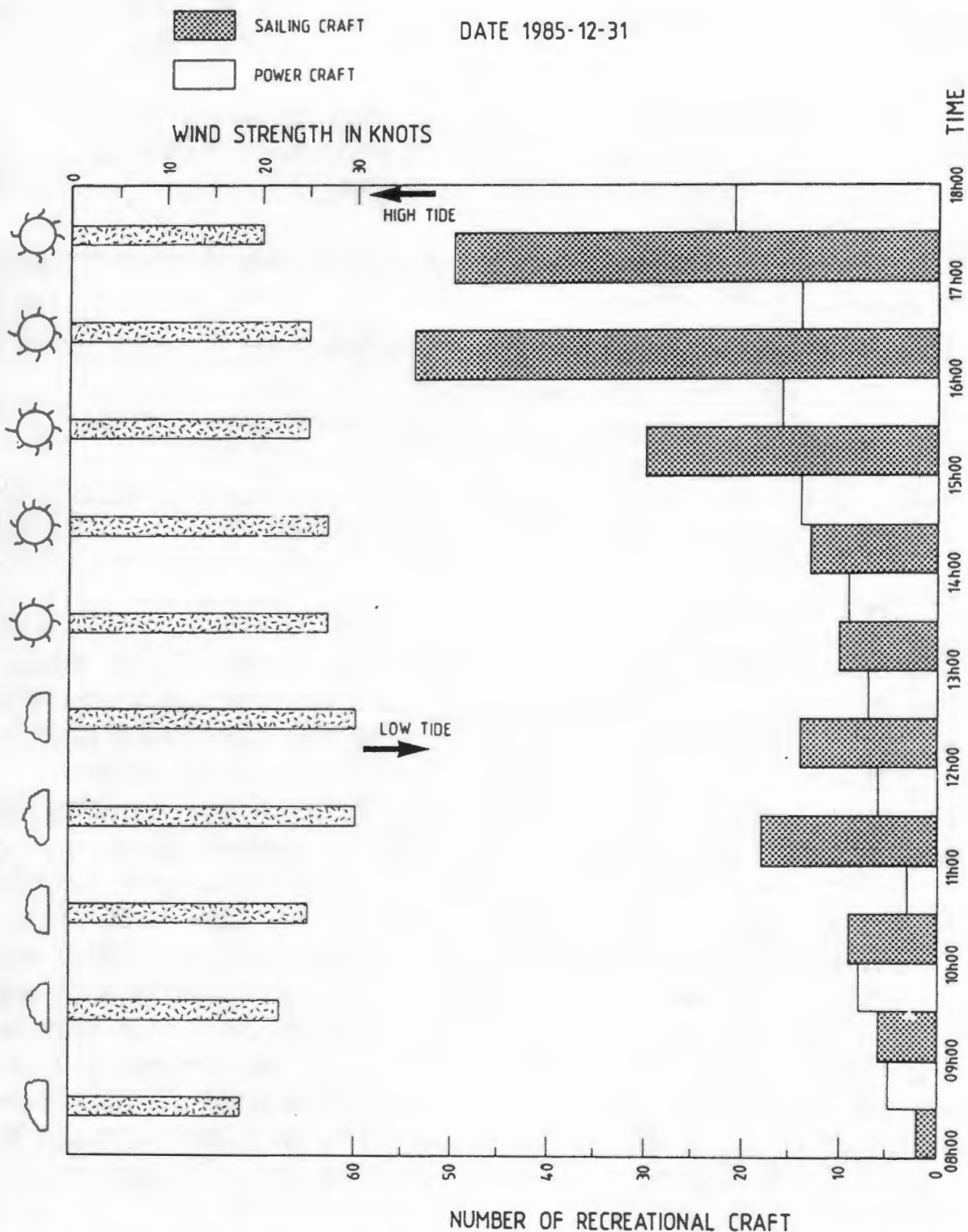


Fig. 3. Results of observations of recreational boating activities for 31 December 1985.

data compare favourably with the findings on the Kromme River estuary for sailing craft, where 10% of the total number of sailing craft present were on the water at the same time during optimum sailing conditions (Table 2, column 2).

Direct observations of powerboating activities indicate that only 5–6% of the total number of powerboats present in the area were active on the estuary at peak periods (Table 2, column 2). As

approximately 30% of powerboats present in the area are used for recreational fishing at sea, this may account for the rather low proportion of powerboats utilizing the estuary during the survey period.

## 7. ASSESSMENT OF THE CARRYING CAPACITY OF THE KROMME RIVER ESTUARY FOR RECREATIONAL CRAFT

Recreational craft utilizing the estuary can be divided into three broad categories:

- (1) rowing craft, which include all craft powered manually such as rowing boats, canoes and paddleskis;
- (2) powerboats, which include all power-driven craft used for aquatic recreational activities; and
- (3) sailing craft, which include hobie cats, sailing dinghies and sailboards.

### 7.1. Rowing craft

Although the total number of rowing craft (551) present in the area is similar to total numbers for the other two categories, 482 and 694 respectively, the number of participants for this category of craft is much lower (Table 1, column 2). Results from daily observations showed that generally less than 3% of the total number of rowing craft present in the area are active on the estuary at the same time.

Most rowing activities take place in a narrow belt approximately 10–25 m wide along the margins of the estuary. In addition, the spatial requirements of rowing craft are low and, because they move slowly, do not interfere with other recreational craft. Thus the ecological and social impact associated with rowing activities on the estuary is considered negligible. For these reasons a thorough assessment of the carrying capacity of the estuary for rowing craft was not undertaken. It is concluded that the estuary can accommodate the additional numbers of rowing craft anticipated at projected low and projected high levels of development.

### 7.2. Powerboats and sailing craft

#### 7.2.1. *Assessment of physical carrying capacity*

Since all land along the banks of the Kromme River is privately owned, access to the estuary for launching craft is restricted. The only suitable

launching and mooring facilities for powerboats are at the Divisional Council public launching site in the marina (Fig. 1). These facilities may only be used by registered powerboat owners of the St Francis Bay local area. Thus powerboat owners who do not own property in the St Francis/Kromme area obviously have difficulty in gaining access to the estuary.

The slipway situated along Shore Road (Fig. 1) provides the only suitable launching site for sailboats. Boardsailors also utilize this stretch of shore for launching as it provides the only suitable public launching site along the estuary. Although boardsailors could gain access to the estuary seawards of this launching site, exposed sand banks would require them to carry their boards some distance across the sand.

Powerboats (including rubber inflatables) are utilized on the Kromme River for fishing, waterskiing and general cruising. All powerboating is extremely space demanding, but research has shown that different powerboat activities have different spatial requirements. Waterskiing is especially space demanding.<sup>3,13</sup> The high spatial requirement is based on the combined factors of the length of the boat-rig-skier, the relatively high speeds required to tow a skier, and the slalom course followed by these boats. The generally recommended space standards for safe waterskiing are between 8 and 16 ha per boat.<sup>2,3,13</sup>

The spatial requirements for fishing from a boat are less than for waterskiing. The most commonly practised methods of fishing on the Kromme estuary are with a spinning or casting rod or with handlines. For casting, the minimum space requirement will be the distance the fisherman will cast, which is approximately 25 m.<sup>14</sup> From a review of the literature the most generally recommended space standard for fishing from a boat is 1 boat per 4 ha,<sup>2,13</sup> although Baud-Bovy<sup>15</sup> recommends 2 boats per ha. These recommended space standards do not take into account whether this level of boat density is acceptable to the fisherman.

Recommended spatial requirements for cruising vary, depending on the nature of the activity but the most commonly used space standard is 1.2 ha per boat.<sup>5,15</sup>

Since all these powerboating activities are taking place on the Kromme River estuary simultaneously, but in different proportions depending on weather and tide conditions, an overall standard of 4 ha per boat has been adopted for this study. This standard, as an aggregate of various activities, has also been recommended in the literature.<sup>2,6</sup>

The area of water available for recreational boating within the study area is approximately 125 ha although this figure varies between high and low tide. Assuming that 5% of powerboats are on the water at the

same time (Section 6), the following space standards would be achieved for different estimates of population numbers presented in the area.

The current estimate of powerboats present in the area is 482 (this figure includes current estimates of rubber inflatables). Therefore, if 5% of this figure are active, 24 boats would be on the water at the same time and 5.2 ha of water space would be available per boat.

The projected low estimate of numbers of powerboats using the estuary is 625. Thus if 5% of these boats were on the water at the same time, 4 ha per boat would be available, this being the space standard recommended for general purpose boating. But at projected high levels of development, 68 powerboats could be utilizing the estuary simultaneously. This would result in only 1.8 ha of water per powerboat, which is well below the recommended spatial requirement for general powerboating.

As many powerboat owners do not require launching facilities, existing launching facilities, as well as parking facilities for vehicles and boat trailers at the public launching site, are adequate for the current powerboating pressure in the area. However, since the number of powerboats anticipated in the area may almost treble when all 1356 residential properties are developed, additional facilities will have to be provided to accommodate future powerboating pressure.

Recommended space standards for sailing activities vary from 10 craft ha<sup>-1</sup> for boardsailing<sup>16</sup> to 1–3 craft ha<sup>-1</sup> for other sailing boats.<sup>2,15</sup> As sailboards account for 73% of the total numbers of sailing craft present in the area (Table 2), an overall space standard of 4 craft ha<sup>-1</sup> has been adopted for this study.

Daily observations revealed that approximately 10% of sailing craft could be present on the water simultaneously in optimum conditions. Thus, the current estimate of numbers of sailing craft utilizing the estuary is 10% × 694 = 69 sailboats. Hence 1.8 ha per sailing craft would be available.

At the projected low estimate of use, 1.4 ha would be available per craft, this being within the recommended space standards for sailing activities. At the projected high estimate of sailing pressure on the estuary, it is anticipated that 197 sailing craft could be on the water at the same time. Thus 0.6 ha of water would be available per sailing craft, i.e. approximately 1.6 craft ha<sup>-1</sup>.

If the Kromme River estuary was utilized only for sailing activities, the current and projected numbers of sailing craft anticipated on the water during peak periods could be accommodated. But, since both powerboats and sailing craft utilize the estuary, although in different

proportions depending on wind and tide conditions, the spatial requirements when both types of craft are active must be considered.

From calculations on space available for powerboats at the projected low estimate (4 ha per boat), it is anticipated that with the additional space required for 90 sailing craft the physical carrying capacity of the estuary will be exceeded during peak holiday periods.

It is clear that, at projected high levels of development, the area of water available on the estuary is inadequate to accommodate increased numbers of recreational craft. At this projected high level of use, the physical carrying capacity of the estuary will be greatly exceeded.

Questionnaire analysis and daily observations revealed that few sailing dinghies and hobie cats are launched at the public slipway along Shore Road (Fig. 1). Thus, at current and even projected levels of use, this slipway should be adequate to cope with anticipated sailboat pressure.

But, as this section of shoreline (adjacent to Shore Road) provides the only public and suitable access for sailboards, the area of water between Lot 710 and Lot 644 (Fig. 1) is intensively utilized, and even overcrowded, in optimum sailing conditions. Parking facilities for vehicles and trailers of boardsailors and sailboat owners are totally inadequate to accommodate current pressure during peak holiday periods. In addition, boardsailors utilize the grass area adjacent to the slipway to rig their boards. Thus, it is anticipated that congestion along the shore, on waters adjacent to this launching site, in the parking area at the western end of Shore Road and along Shore Road itself will increase markedly with the projected increase in numbers of sailing craft utilizing the area.

### *7.2.2. Assessment of ecological carrying capacity*

Along the south bank of the estuary above the road bridge (Fig. 1), severe bank erosion is evident. Riparian property owners have attempted to rehabilitate the banks by building stone walls, and where this has failed old tyres have been stacked to stabilize the banks. Many property owners attribute the erosion of the banks to powerboating activities.

While some authors<sup>1,17,18</sup> contend that powerboating causes bank erosion and turbulence, others<sup>19</sup> dispute this. At present there is no quantitative evidence which specifically relates levels and frequencies of use by powerboats to rates of erosion. This would be difficult to prove conclusively since natural processes and other man-induced changes may be contributing to the erosion process. It is therefore only possible

to postulate that powerboating activities are contributing to the erosion of river banks, and that the anticipated increase in powerboating on the estuary will exacerbate the erosion process.

The Kromme River estuary and associated wetlands provide habitats for several bird species. Although development activities have probably resulted in reduction of the bird populations formerly present in the area, extensive intertidal mudflats and saltmarsh areas on the north bank, seaward of the road bridge, provide a suitable habitat for about 1000 waders.<sup>20</sup> The river mouth area is too disturbed by recreational activities to be an important breeding locality. Research by Rowlands<sup>21</sup> on the effects of recreational boating on aquatic avifauna has shown that, of all boating activities, powerboating causes the greatest disturbance to birds. Sailing craft also disturb birds, but the area of disturbance is relatively small.

Thus, with projected estimates of increased numbers of powerboats utilizing the estuary, it is anticipated that greater disturbance to bird populations will result and fewer birds will utilize the area for feeding, shelter and breeding. The ecological ramifications of a reduced bird population, the top predator in the estuarine ecosystem, could be far-reaching.

### 7.2.3. *Assessment of social carrying capacity*

This aspect of the assessment procedure is concerned with determining the levels of crowding that are acceptable to most users of the estuary. This information was obtained from questionnaire analysis.

The responses to the question:

Do you think that the existing boat launching facilities and car and boat trailer parks along the Kromme River estuary can support more people during peak holiday periods?

Yes  No

gave an indication of people's perception of the facilities capacity along the estuary. Of the questionnaire respondents, 73% felt that the existing facilities could not support more people during peak holiday periods. This response indicates that the current levels of crowding experienced at the Shore Road launching and parking site (Fig. 1) are already unacceptable to the majority of respondents.

In another question, people were asked whether they considered the area of surface water on the Kromme River estuary to be crowded by recreational craft during peak holiday periods: 75% replied 'Yes', 17% answered 'No', and 8% did not answer this question. Of the 17% that answered 'No' 26 respondents (i.e. 7%) felt that the estuary could

accommodate 10% more craft while 20 respondents (i.e. 6%) suggested that 25% more craft could utilize the estuary during peak periods.

This response suggests that for the majority of people who utilize the estuary for recreational boating the resource is crowded, i.e. the social carrying capacity has already been reached. Thus, projections of future levels of use by recreational craft on the estuary would certainly be unacceptable to most current users.

Those people who felt that the water surface was crowded during peak periods were asked to respond to the following question:

In your opinion, what would be the most effective way of preventing congestion on the Kromme River estuary?

(Please tick (✓) all options that are acceptable to you)

	<i>No. respondents</i>
Activity zoning (different activities allocated to specific parts of the estuary)	158
Time zoning (different activities allowed on the estuary at certain times of the day)	27
Registration and strict control of sailing and power craft	191
Limiting the number of powerboats allowed on the estuary per household	114
Restricting development in the area	164

These responses provide a useful guide to decision-making authorities as to the measures to prevent congestion on the water that would be acceptable to those utilizing the estuary.

Another issue relating to recreational boating, and one which could have serious social implications, was the use of the Kromme River by commercial fishing boats. Good catches of *Loligo reynaudi* in the coastal waters in the vicinity of the Kromme River over the past 8 months have resulted in an influx of commercial fishing boats. Fishermen seek suitable launching facilities for their boats, and at present utilize the marina waterways and estuary to gain access to the sea.

Questionnaire analysis revealed that the proposed development of facilities for commercial boats in the Kromme River estuary is strongly opposed by the majority (79%) of property owners and holidaymakers to the area. It is anticipated that the establishment of such facilities will have serious negative social impacts on recreationists using the Kromme River estuary.

## 8. MAJOR CONSTRAINTS FOR FURTHER DEVELOPMENT

### 8.1. Physical constraints

The area of water available for recreational boating on the Kromme River estuary is limited and may decrease due to siltation. This is a major constraint for further development in the area. Projections of the number of craft that will use the estuary in future indicate that congestion of the water surface will occur as recommended space standards for recreational boating will be exceeded.

Suitable public access to the estuary for sailboards is limited. The major launching site along Shore Road is inadequate to accommodate the projected increase in numbers of boardsailors that will require access to the estuary.

Parking facilities along Shore Road are inadequate to accommodate current numbers of vehicles and boat trailers. An increase in the number of recreational craft using the estuary will exacerbate the existing problem of congestion.

It is anticipated that existing ancillary shore and mooring facilities for powerboats will be inadequate to cope with projected powerboat numbers when all currently undeveloped residential sites are built on. Beach Canal (Fig. 1), which links the marina waterways to the estuary, will become increasingly congested during peak holiday seasons.

### 8.2. Ecological constraints

An increasing number of powerboats using the estuary may accelerate the process of bank erosion, particularly on the south bank of the estuary above the road bridge. An increase in the number of recreational craft, especially powerboats, will cause disturbance to bird populations. A reduced bird population in the area could result in secondary ecological impacts throughout the estuarine ecosystem.

### 8.3. Social constraints

Overcrowding and congestion on the water surface will be intensified by additional holidaymakers in the area as more residential sites are developed. Congestion will reduce the quality of the experience for those using the estuary for recreation.

Overcrowding at the major sailboard launching site on Shore Road constitutes a negative social impact. Increased numbers of sailing craft

using this launching area will create more congestion and greater dissatisfaction amongst users and Shore Road property owners.

Incompatible recreational activities taking place in the same area on the water will result in conflicts between different interest groups. Risk of collision will be intensified as more recreational craft utilize the estuary.

The use of the Kromme River estuary by commercial fishing boats is strongly opposed by the majority of residents and holidaymakers. The development of facilities for commercial fishing boats on the estuary will have a negative social impact on recreational boating in the Kromme River estuary.

## 9. CONCLUSIONS

This assessment of the carrying capacity of the Kromme River estuary for recreational craft has indicated that, at present levels of use, carrying capacity is not exceeded. Nevertheless, the area of water adjacent to the Shore Road launching site is an area of potential conflict where incompatible recreational activities (waterskiing, boat-fishing and sailing) are all intensively pursued. In this area recreational carrying capacity is exceeded. Measures, such as activity zoning, should be introduced during peak holiday periods in order to regulate boating activities and so increase the safety and enjoyment of recreational boating on the estuary.

The building sites of the St Francis/Kromme area are at present only 46% developed. Projections of the numbers of recreational craft that will use the Kromme River estuary when all currently undeveloped sites are built upon indicate that the carrying capacity of the estuary for recreational craft will be exceeded during peak holiday periods. It is anticipated that the water surface will become congested, and that conflicts between different recreation interest groups will result. In addition, with increased congestion, the potential risk of collision between recreational craft will be increased.

Thus, new developments in the St Francis/Kromme area which will result in an increase in the number of boats using the estuary should not be permitted unless careful measures are introduced to regulate the numbers and activities of boats using the estuary during peak holiday periods.

Since approximately 30% of the powerboats present in the area were utilized for recreational fishing at sea, it would be desirable to develop launching facilities for powerboats which provide direct access into St

Francis Bay. This would reduce unnecessary powerboat traffic on the estuary, and in the channel leading from the marina into the main river.

This investigation has also indicated that additional public access to the estuary should be provided for boardsailors. An access site upstream from the Shore Road launching site would be preferable because of sand banks situated towards the mouth. Expansion of ancillary shore facilities will also become necessary as additional undeveloped property is built upon.

Finally, it is concluded that new development activities which will alter the character of the area or reduce the recreational potential of the estuary should not be permitted. Property owners and holiday-makers will be strongly opposed to such developments. Thus, the proposed development of facilities for commercial fishing boats should be abandoned.

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APPENDIX 3

THE PANEL EVALUATION METHOD: AN APPROACH TO  
EVALUATING CONTROVERSIAL RESOURCE  
ALLOCATION PROPOSALS

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## FEATURES

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# THE PANEL EVALUATION METHOD: AN APPROACH TO EVALUATING CONTROVERSIAL RESOURCE ALLOCATION PROPOSALS

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*The Panel Evaluation Method was developed to deal with complex and controversial resource allocation proposals. It links and extends the capabilities of Environmental Impact Assessment and Cost-Benefit Analysis, accomplishing a comprehensive and systematic evaluation of competing proposals. The paper focuses on the Significance Measurement Technique, which was designed to determine the relative significance of impacts so that proposals could be ranked according to the efficiency criterion. It is shown to produce replicable measurements of efficiency, thus providing a satisfactory means of assessing the benefits and costs of a proposal. This paper also reports on an investigation undertaken to further test the reliability of PEM.*

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### Introduction

When a new development is proposed that would significantly affect an area that is regarded as "sensitive" because of its special values, there is a potential conflict that involves three groups: those who would gain from the proposal, those who would lose, and those who have jurisdictional responsibilities for the area. Thus, there is a strong incentive to adopt a procedure for mediating the

conflict, or for subjecting the proposals to an evaluation process that is systematic, explicit, comprehensive, and unbiased.

Any procedure for resolving such conflicts will have to provide answers to the following questions:

- What is the nature of the proposal and the area that will be affected?
- What will be gained and what will be lost if the proposal is approved?
- Who will be the gainers and who will be the losers?
- What will be the significance of these gains and losses to specific groups?
- Are there ways of mitigating losses or compensating losers, and are the costs of mitigation/compensation reasonable?
- For society as a whole, will the gains outweigh the losses?

In order to answer these questions adequately, an environmental assessment of some kind is required. There are many environmental assessment methods and techniques, but most lack a rigorous procedure for (1) precisely defining impacts, (2) evaluating the relative social significance of both the positive and negative impacts of a proposal, and (3) applying and trading-off specified evaluation criteria. A major task in environmental planning and assessment is to identify viable alternatives that can accomplish the purpose of the original proposal in a way that is more environmentally acceptable. Environmental planning and assessment is very often an exercise in compromise—in fact, the central focus is on finding a way to satisfy all concerned parties.

In most cases informal evaluations conducted during the environmental planning and assessment process will suffice to identify the preferred action. This approach, which is known in South Africa as Integrated Environmental Management (IEM) (Council for the Environment 1989) is aimed at defusing controversy through public participation and iterative planning and assessment techniques. But in some cases the controversy may be so intense that opposing interest groups will not accept the informal evaluations performed by analysts and decision makers; in these cases formal evaluations of significance, conducted by a respected and unbiased panel might be more acceptable to all concerned parties.

### *The Evaluation Problem*

Many environmental assessments and evaluations done throughout the world make frequent use of the word “significant” without clearly conveying what is meant by the term or providing any explanation of how determinations of significance have been made. This is in spite of the obvious and central importance of the concept in environmental impact assessment (Duinker and Beanlands 1986). In this paper important distinctions are made between the terms “assessment” and “evaluation,” and between the terms “informal evaluation” and “formal evaluation.” The term “assessment” refers to the process of

collecting, organizing, analyzing, interpreting, and communicating data and is relevant to some decisions. The term "evaluation" implies the act of making value judgments or ascribing subjective values to data in order to determine their importance to some goal or their significance to some decision.

An informal evaluation is understood to consist of a relatively casual and personal evaluation in which subjective value judgments are not clearly articulated or systematically related, or expressed in numerical terms, and the object of evaluation is to "satisfice" rather than "optimize" (Janis and Mann 1977; Simon 1978). Finally, a formal evaluation consists of a systematic process of significance measurement, performed by an individual or a group, in which subjective value judgments are clearly articulated and related, using numerical terms, and an attempt is made to optimize.

### **Principal Features of the Panel Evaluation Method**

This paper describes the Panel Evaluation Method (PEM), which is a procedure used to systematically identify and evaluate environmental impacts (biophysical as well as socio-economic) and to apply specific evaluation criteria to competing resource allocation proposals. The first objective in the development of PEM was to provide a procedure to ensure that each impact of possible concern to anyone would be clearly identified and carefully defined; the second objective was to provide a mechanism for making subjective value judgments explicit, and for expressing these judgments in quantitative terms using a procedure that produces replicable results; the third objective was to develop practical procedures for applying and trading-off various evaluation criteria to identify which proposal was superior. PEM has been designed to facilitate resource allocation decisions (and promote public acceptance of decisions) in disputes that are characterized by (1) great uncertainty as to the types of impacts that might result, and (2) great difficulty in obtaining value information to determine the significance of impacts and the ultimate social value of the competing proposals.

The three principal features of PEM are the Impact Identification Technique (IIT), the Significance Measurement Technique (SMT), and the Criteria Trade-Off Technique (CTT). IIT is concerned with identifying and defining the potentially significant impacts of a proposal. SMT is concerned with judging the relative significance of these impacts. CTT is concerned with applying and trading-off relevant evaluation criteria.

### **Development of Evaluation Criteria**

If an evaluation procedure is to be acceptable to all concerned parties, it is important to define a rational goal for resource management activities, as well as a set of suitable criteria by which to judge whether a given action will carry society towards or away from that goal. The choice of goal and the selection of evaluation criteria in the development of PEM were based on certain a priori premises derived largely from economic theory (Stauth 1983a and 1989). The

goal, objectives, and criteria were defined as follows:

- The **goal** of resource allocation is to achieve the highest possible level of social well-being over a time period spanning multiple operations.
- Resource management **objectives** are to make resource use efficient, equitable, and sustainable.
- The **criteria** for evaluating resource allocation proposals are to determine its efficiency, equity, and sustainability. An action is efficient if those who benefit could potentially compensate those who bear costs and still be better off, so that total benefits exceed total costs. An action is equitable if it improves the distribution of welfare among different social groups comprising present-day society. An action is sustainable if it improves the prospects that future generations will enjoy the same level of welfare as is enjoyed by members of present-day society.

Most resource managers would agree that efficiency is not the only criterion that should be applied when comparing alternative resource allocation options. Consideration must also be given to how costs and benefits would be distributed amongst different groups in present-day society, as well as between present and future generations. Nevertheless, a proposal that is inefficient will generally not be given serious consideration as, for most resource managers, the principal concern is to find ways to increase the net benefits that can be obtained from a given number of resources. A major difficulty has been determining how to measure efficiency when significant unpriced costs and benefits are associated with competing resource allocation proposals.

### Cost-Benefit Analysis

The efficiency of a resource allocation proposal can be determined by an evaluation method called Cost-Benefit Analysis (CBA)—sometimes called Social Cost-Benefit Analysis or Benefit-Cost Analysis. This method has been widely used in the United States and elsewhere to evaluate major resource allocation decisions, such as water storage projects (Kneese 1984; Pearce 1983).

Although CBA provides a rational framework for evaluation, the method has been criticized for its failure to take adequate account of those costs and benefits that are difficult or impossible to measure in monetary terms and to provide a way to apply and trade off other evaluation criteria. In fact, environmental impact assessment and social impact assessment evolved largely as a response to the need to find some way to give equal attention to unpriced environmental costs in the decision-making process and to ensure that the distributional consequences of resource allocation decisions (including effects on future generations) were given appropriate consideration (Clark 1984; Pearce 1983).

Several resource economists have developed and applied a variety of “shadow-pricing techniques” to estimate the value that these unpriced “goods”

and "bads" would have if markets could be established for them; in addition, other techniques have been developed (such as contingency-price valuation) to ensure that completely "nonmonetizable" impacts are explicitly considered within a cost-benefit framework (Dohan 1977; Krutilla et al. 1972; Pearce 1983). There are, however, often a great number of significant unpriced effects associated with proposals and shadow-pricing techniques are either too expensive or too unreliable to apply. This problem is particularly serious in lesser-developed countries in which inadequate resources for conducting formal evaluations and considerable scepticism of sophisticated shadow-pricing techniques exist. The decision-maker is then left with the problem of weighing the combined value of a large number of complex outcomes (usually expressed in incommensurable units) against a given sum of money (usually a large figure, and therefore hard to conceptualize or compare against unpriced effects).

There is thus a need for a procedure that extends the capabilities of CBA by providing a rational method to weigh the costs and benefits associated with changes in environmental flows that cannot be valued by the market (such as impacts to certain ecological processes and natural amenities), and then comparing the "value" of these outcomes to that of changes in economic flow and other outcomes that can be measured in monetary terms. At present, no method of environmental impact assessment (EIA) exists that provides adequate value information to judge the relative efficiency of major competing proposals.

### **The Delphi Method**

One method that has potential for extending the capabilities of CBA and EIA is the Delphi method (Dalkey and Helmer 1963; Dalkey et al. 1972; Pill 1971). The Delphi method was developed at the Rand Corporation in the United States to improve decision-making under uncertainty and in situations in which values were in conflict. The rationale underpinning Delphi is that, although each individual's view in such situations is incomplete, individuals will tend to recognize the validity or value of other viewpoints, so that aggregations of individual models will not only be more valid, but will tend to be accepted as a better, more balanced model (Dalkey et al. 1972). The principal features of Delphi are anonymous debate, controlled feedback from two or more iterations of assessment or evaluation, and statistical group response. The object of the Delphi method is to elicit and reconcile or aggregate the judgments of generally knowledgeable, unbiased, and respected persons in a systematic fashion to obtain a group viewpoint.

### **General Description of The Panel Evaluation Method**

PEM consists of a set of procedures for undertaking group evaluations of environmental impacts (including social and economic impacts) within a cost-benefit framework. The major steps of PEM are:

1. Select suitable individuals to sit on an evaluation panel.
2. Define the potential social costs and benefits (adverse and beneficial impacts) of a proposal.
3. Rate the importance to society of incurring these costs and benefits.
4. Reconsider ratings in light of statistical and other feedback on group judgments. (This step is normally accomplished twice.)
5. Rank-order the costs on one list, and the benefits on another list, and then estimate the relative "weight" (or importance) of each item on each of the two lists.
6. Determine whether the costs outweigh the benefits or vice versa.
7. Judge whether the efficiency gain (loss) outweighs any adverse (beneficial) intergenerational or intragenerational distributional effects.

PEM is directed at accomplishing three of the most difficult and challenging tasks of evaluation: (1) forecasting the impacts of a proposed development (identifying and defining the potential impacts); (2) judging the relative significance of these forecast impacts ("weighing up" or making comparative evaluations of the impacts), and (3) trading-off evaluation criteria (in a systematic and explicit way). These tasks are accomplished with techniques featuring iterative procedures based on Delphi principles.

Following is a brief description of the three major techniques comprising PEM. IIT and SMT will be explained in more detail in a later section. Since this paper is principally concerned with presenting an approach for judging the relative efficiency of two competing proposals, there will be no further discussion of CTT. For a full description of all aspects of PEM and IEM see Stauth (1989).

### *The Impact Identification Technique*

The Impact Identification Technique is concerned with producing a comprehensive list of precisely defined "end impacts" (Abelson 1976); impacts expressed in such a way that they indicate their effect on social well-being, that are truly discrete or "independent" (i.e., the impacts do not interact or overlap). Impacts are then arranged in two lists—adverse impacts (costs), and beneficial impacts (benefits)—to be subjected to a formal evaluation procedure. Impacts of competing proposals can also be defined in such a way that only two lists of impacts are produced for comparative evaluation. (For details, see Stauth 1989.)

Impact identification and definition is accomplished with the aid of two groups: the evaluation panel that will later weigh the impacts using SMT, and representatives of affected parties and other concerned groups.

### *The Significance Measurement Technique (SMT)*

The Significance Measurement Technique is concerned with weighting the impacts on each of the two lists (costs and benefits). The object is to obtain a

group judgment as to the relative social significance of the items on each list using a rigorous procedure which ensures that all subjective value judgments are thoroughly considered, carefully weighed and made completely explicit. This information can then be used to make efficiency determinations.

### *The Criteria Trade-Off Technique (CTT)*

The Criteria Trade-Off Technique is concerned with systematically comparing the effects of each proposal in terms of three evaluation criteria: efficiency, equity, and sustainability. The object is to obtain a group judgment as to which proposal best satisfies all three criteria taken together, so that a recommendation can be made as to which proposal is in the best overall interest of society.

### **Ways to Use the Judgments of the Panel**

The output of PEM can be used in several ways to assist decision-makers in evaluating complex trade-offs. Simply having a comprehensive, carefully defined list of impacts is of great value because it ensures that all concerns have been clearly articulated. Such a list will also be helpful in guiding impact assessment and ensuring that only relevant issues will be investigated. Having these impacts ranked in order of importance by an unbiased and respected multi-disciplinary group of "holistic thinkers" serves to identify the major impacts, so that attention can be directed to the task of designing mitigation measures or finding suitable mechanisms of compensation. Finally, the formal application of a significance-measurement procedure and criteria trade-off procedure by a panel comprised of persons who are widely regarded as knowledgeable and concerned about man-environment relations, but who have no vested interests in the decision that will be taken, can increase public confidence that a rational, objective, and thorough evaluation of the respective merits of the various alternatives has been undertaken.

To have credibility, the evaluation process must be accomplished by persons perceived to be unbiased or neutral as to the decision and who are widely respected so that their judgments will be accepted by all concerned parties.

### **Description of the IIT**

Many methods of environmental evaluation do not employ a rigorous procedure for ensuring that all potential impacts (of possible concern to anyone) are clearly identified and then carefully defined to ensure that all parties will interpret them in the same way. This common failing often results in complaints that certain community concerns or special interests were not correctly interpreted or understood, and these concerns were therefore not properly evaluated or adequately addressed in the environmental report. Imprecise or ambiguous definitions can also cloud the evaluation (as people will have different perceptions of what is being evaluated) and can lead to "double counting." Therefore, in IIT considerable attention is given to the problem of articulating

concise and unambiguous statements that accurately convey the nature of each impact.

After the panelists have been selected, they are given a briefing document (which provides information relating to the proposal and the affected environment) and then taken on a site visit where they have an opportunity to ask questions. Following this visit, the panelists are asked to identify independently and anonymously (and concisely define, in sentence form) the impacts that could result from the proposal. Each participant submits a list of impacts to the project coordinator, who then produces a synthesized list in which all impacts have been phrased according to their ultimate effect on social well-being ("end impacts"), and all impacts which interact or overlap have been subsumed under more broadly defined impacts. The impact identification and definition process is accomplished through an iterative procedure, usually conducted by post, with feedback on group thinking between each iteration.

The review and re-definition of impacts is repeated until all participants are satisfied that the list of impacts is comprehensive and all impacts are clearly defined. Following this, a detailed environmental investigation of these impacts should be undertaken by appropriate experts and an impact report prepared and distributed to the panelists for review before they attend a meeting to undertake an evaluation of the social significance of the impacts.

### **Description of the SMT**

At the Delphi evaluation meeting, all the panelists are assembled (unless remote computer terminals are available) for a 3- to 4-hour session to judge the relative significance of the impacts. Because of the difficulties in making judgments of this type, panelists are guided through the evaluation task in three distinct steps. These steps are briefly described and then discussed in more detail in the next section.

The first step is to rate the significance of each impact (on each of the two lists in turn) using a preprinted form and applying a Likert-type scale (ranging from 1 to 7). The second step is to rank the impacts on each list in order of importance. This is not difficult or time-consuming because the final ratings assigned by a panelist will provide him or her with a ready guide for ranking. The third step is to weigh the impacts or judge how much more important one is than another. This provides a measure of impact significance on an interval scale, which is the ultimate object of the exercise as this is what is required to provide the value information needed to make an efficiency determination.

The rating and ranking procedures are done solely to aid the panelists in making the difficult weighting judgments. Apart from the fact that it is technically necessary to rank-order the impacts in order to accomplish the weighting procedure (described below), as well as the fact that rating greatly facilitates the ranking procedure when there are more than a few impacts to rank-order, these preliminary steps require the panelists to make value comparisons between the

impacts (albeit on a relatively gross scale), and this experience prepares the panelists for undertaking the more refined measures that are ultimately required of them.

*Steps 1 and 2: Rating and Ranking Impacts*

The rating procedure consists of asking the panelists to rate each impact independently on a scale of 1 to 7 (Figure 1). Panelists are instructed to base these ratings on their assessment of what members of society might feel if they had

IMPACT RATING FORM

PARTICIPANT'S NUMBER: 12.. ITERATION NUMBER...3... DATE: 30-3-89

IMPACT LETTER	VERY UNIMPORTANT		MODERATELY IMPORTANT			EXTREMELY IMPORTANT		IMPACT LETTER
	1	2	3	4	5	6	7	
A		2						A
B			3					B
C							7	C
D					5			D
E						6		E
F		2						F
G	1							G
H		2						H
I	1							I
J	1							J
	1	2	3	4	5	6	7	

FIGURE 1. Example of a completed Impact Rating Form

## VOTING FOR X

## LOST RECREATION AND TOURISM BENEFITS

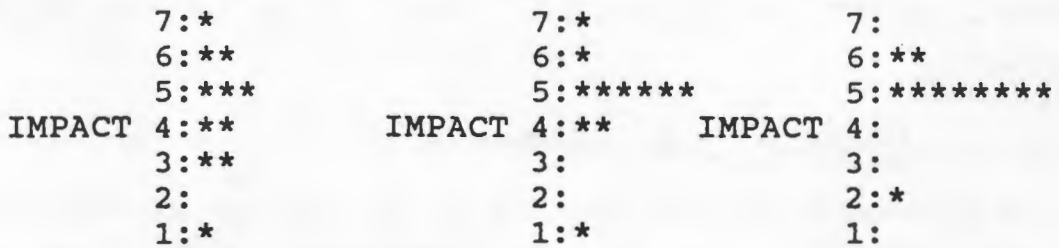


FIGURE 2. Example of three iterations of Rating Feedback

perfect information and were acting in the interests of society as a whole. The judgments of the panelists are then tabulated and displayed to the panel in the form of histograms (see Figure 2).

Each panelist is asked to compare his rating with those of the rest of the group and to consider reasons for any differences. At this point panelists who may have special knowledge are provided with an opportunity to convey anonymously this information to other members of the panel. Panelists are asked to confine their comments to points of fact: emotional arguments or appeals are not relayed to the panel. In addition, panelists whose ratings differ greatly from the rest of the group may anonymously request additional information. Any comments or requests are written and submitted to the project coordinator.

The process can be continued until there is no further convergence toward consensus or there are no new comments offered, but normally three iterations will be sufficient. After the final feedback, panelists are asked to rate the impacts one at a time and use this rating to rank-order the impacts (Figure 3).

### Step 3: Weighting Impacts

Each panelist accomplishes a ratio-scoring procedure that indicates just how important (i.e., socially significant) each impact is, relative to every other impact. The weighting or ratio-scoring procedure is applied first to one list (e.g., List of Costs) and then to the other (e.g., List of Benefits).

There are two difficulties in aggregating the subjective weightings of two or more people (Linstone and Turoff 1975): (1) there is no true zero point to which measurements by different individuals can be related (the problem of subjective origins), and (2) there is no common unit of measurement utilized by different individuals (the problem of subjective scale units). The latter problem, the fact that people use variable scale units, can easily be resolved by employing fractionation techniques and normalizing scores (i.e., converting each individual's scores to percentage values), but if each person's scale is related to a different base the measurements cannot be aggregated without distortion. The

PARTICIPANT'S NUMBER: ... 12 .....

DATE: 30-3-89 .....

RANKING	IMPACT LETTER
1	C
2	E
3	D
4	B
5	F
6	H
7	A
8	I
9	G
10	J

FIGURE 3. Example of Rank-Order of Rated Impacts

establishment of an acceptable common point of origin is therefore essential.

There appears to be no way to establish common ground at the upper end of the scale, but Edwards (1977) points out that less distortion in the aggregation of individual scores will occur if scaling is done from the least important item. This suggests that an approximate zero point may be established if the list of impacts includes several that are of rather marginal significance (i.e., some that many people would regard as being of very little significance). If each individual identifies the lowest-ranked impact that is above his "threshold of significance" (i.e., the point at which valuation becomes meaningful), then the "threshold impact" can be regarded as a practical psychological datum point for subjective value judgments so that a reasonably objective scale for measuring these judgments can be derived.

An explanation of the recommended ratio-scoring procedure (Figure 4) follows.

1. Each panelist reviews the impacts on his list and gives a zero weight to any at the bottom of the list that, in his judgment, have no real significance to society. He then identifies the lowest-ranked impact that has at least some

IMPACT WEIGHTING FORM
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PARTICIPANT'S NUMBER: . . . . . 12 . . . . .

DATE: 30-3-89 . . . . .

RANKING	IMPACT LETTER	WEIGHTING
1	C	160
2	E	85
3	D	80
4	B	20
5	F	10
6	H	X
7	A	X
8	I	X
9	G	X
10	J	X

FIGURE 4. Example of a completed Impact Weighting Form

significance, and assigns this impact a weight of 10. This impact is now called the "threshold impact" and will be used as the standard against which the significance of all impacts ranked above it are compared.

2. The panelist then gives a weight to the next most important impact on his list which indicates the ratio of its importance to the threshold impact. For example, if it is regarded as twice as important as the threshold impact, it gets a weight of 20.

3. The relative importance of the next impact on the list is then evaluated against the threshold impact and a weight is assigned that expresses its relative importance as a ratio.

4. The panelist then makes a consistency check to ensure that the resulting ratio of importance between the impacts evaluated thus far is reasonable.

5. The procedure continues, with the panelist weighting all impacts against the threshold impact and making continuous consistency checks, until all impacts have been weighted and their relative importance is judged to be reasonable and consistent.

After both lists of impacts (e.g., costs and benefits) have been weighted in the manner described above, a final step can be taken to ensure that the threshold

**TABLE 1. Normalising Group Scores: A Worked Example**  
**Step 1: Individual Weighting**

Impact letter	Panelist P		Panelist Q		Panelist R	
	Impact weight	Normalised score (%)	Impact weight	Normalised score (%)	Impact weight	Normalised score (%)
A	500	64.9	10	7.7	150	25.5
B	160	20.8	10	7.7	60	10.6
C	80	10.4	20	15.4	300	53.1
D	20	2.6	35	26.9	30	5.3
E	10	1.3	30	23.1	15	2.7
F	0	0.0	25	19.2	10	1.8
Total	770	100.0%	130	100.0%	565	100.0%

**Step 2: Group Weighting**

Panelist	Impact						Total
	A	B	C	D	E	F	
P	64.9	20.8	10.4	2.6	1.3	0.0	100
Q	7.7	7.7	15.4	26.9	23.1	19.2	100
R	26.5	10.6	53.1	5.3	2.7	1.8	100
Total	99.1	39.1	78.9	34.8	27.1	21.0	300
Group average weighting (%)	33	13	26	12	9	7	100

impacts on both lists are essentially equivalent. Each panelist should be asked to compare the two threshold impacts and indicate whether they are of comparable significance. If they are not, then the panelist should be asked to assign a score to the more significant one that reflects its ratio of importance to the other threshold impact. This "linking ratio" can then be used to adjust the weights of the impacts on the list that have the higher weighted threshold impact. It will then be possible to sum the costs and benefits and determine whether the proposal has been judged to be efficient or not.

Once the weighting scores of individual panelists are available, they are submitted for processing to obtain a group measurement of the significance of the impacts on an interval scale. First, the impact weights of each panelist are summed, individual weights divided by the sum, and each result multiplied by 100 to convert scores to a percentage scale. After this, the percentage scores of all panelists for each impact are summed, and the total divided by the number of panelists, to obtain a group score or weighting for each impact. The relative significance of the impacts, Table 1, illustrates how individual scores are combined to produce a group score.

### **Evaluating the Efficacy and Reliability of SMT**

Because of the central importance and difficulty of measuring the significance of unpriced values, the focus of this research was to devise and test a reliable technique for making efficiency judgments. In order to evaluate the efficacy and reliability of SMT (i.e., whether the evaluation procedure improves group judgments and produces replicable results), three tests can be applied (Dalkey et al. 1972): (1) there should be convergence with feedback (i.e., movement toward consensus) over the various iterations of rating; (2) there should be a unimodal or single-peaked distribution of responses (rather than bimodal or twin-peaked) for the final rating; (3) essentially the same results should be attained by another, similarly composed panel given the same information and following the same procedures.

In addition, if the evaluation procedure is to have practical applicability, participants and concerned parties should feel satisfied that the group judgment is valid and has been improved by the procedure and that costs incurred (time, manpower, and monetary) have been reasonable and worthwhile.

These tests were applied to a case study in 1983 by Stauth, and the results indicated that the method is valid, replicable, and has high acceptability (Stauth 1983b). In this study, two multi-disciplinary evaluation panels were formed to conduct a study of a controversial proposal to develop an inland marina in a lagoon system near Cape Town. An analysis of the results of the evaluations undertaken by these two panels indicated that all three tests for claiming the procedure improved group judgments had been met.

A more thorough testing program was conducted by the authors from 1983–1988. During the course of the research, nine panels were formed to evaluate impacts related to three water development proposals that would affect the conservation status of a major botanical reserve near Cape Town. It was found that the divergence of opinion existing within a panel declined from the first to the third iteration of rating, in 95% of the 285 cases assessed; the distribution of responses in the final iteration of rating was unimodal (single-peaked) in 86% of the 285 cases assessed; and there was a strong positive correlation (0.7 or greater) in 93% of the 92 cases assessed—nearly half of the 92 correlations were greater than 0.9.

The results of these tests indicate that SMT is capable of improving group judgment, and is a reliable procedure for evaluating the social significance of impacts.

### **Evaluating the Efficiency and Reliability of IIT Using a South African Case Study**

Although results have shown that PEM improves group judgment and that the application of SMT can produce similar rating and weighting results from two independent panels. However, they have not conclusively demonstrated that the process of identifying impacts is replicable, that is, if two similarly composed multi-disciplinary panels will identify impacts that are comparable.

Because the list of impacts generated is critical to the evaluation of the relative significance and indeed to the final decision as to whether the proposal should be approved or abandoned, it is necessary to know whether the impacts generated by a carefully selected multi-disciplinary panel of experts are comprehensive and accurate.

In order to evaluate the efficiency and reliability of IIT two independent multi-disciplinary panels were appointed to identify and evaluate the impacts that could result from a proposed coastal township development. The key objective of this exercise was to test IIT for reliability by comparing the responses of two similarly composed multi-disciplinary panels in their identification of impacts. The second objective of this study was to investigate the role of the coordinator in the evaluation procedure and to determine to what extent he or she might influence the results of the evaluation. This was necessary as Richey et al. (1985a and 1985b) and Bakus et al. (1982) indicated that the most serious potential weakness of the Delphi Method was the dependence on the objectivity and ability of the monitor team (coordinator). This case study has provided an opportunity to assess whether or not the output generated by two independent panels is influenced by the coordinator.

Although research has shown that group judgments are more reliable than individual judgments (Zajonc 1965; Seaver 1976), planning and decision-making authorities in South Africa seldom utilize the insights of a multi-disciplinary group to aid in the decision-making process. It would appear that decision makers believe that independent trained ecologists or resource managers can equally and adequately, as well as more cheaply and quickly, provide the information required to undertake such an assessment. This study has provided an opportunity to take a look at the nature and quality of information generated by two individual experts working independently and to compare these results to the responses of the two panels. Thus, a third objective of this study was to compare the output generated from IIT to that of conventional expert assessment.

The fourth and final objective of this study was to evaluate the general efficiency and utility of PEM and its techniques, in terms of cost, time, resources, and manpower.

### **Background to the Case Study**

Infanta is a small coastal holiday township located on the west bank of the Breede River mouth in the southern Cape region of South Africa. During 1980, the Infanta property owners learned that an entrepreneur was planning to make application to develop 100 residential sites on land adjacent to the Infanta township.

The issues of further development along the Infanta coast was of considerable concern to the local property owners, but owing to lack of leadership, local expertise, insufficient resources, and time the community did not appoint a consultant to undertake an environmental impact assessment.

This proposed development scheme provided an ideal opportunity to demonstrate the flexibility of PEM to accommodate the scale and importance of any contentious environmental issue. It also enabled the research team to test the utility of the technique developed by Stauth (1989) under conditions in which few resources were available, for conducting an evaluation, and incomplete information and limited time were available for obtaining the results.

### **Approach to the Study**

In order to investigate whether the impacts identified by two independent multi-disciplinary panels of experts were comparable, two teams of evaluators from the same range of disciplines were selected by the research team.

Because the second objective was to investigate the possible biasing effect of the panel coordinator it was necessary for the two panels to go through identical evaluation exercises but under different panel coordinators. The principal objective of undertaking this exercise was to determine whether the two panels, operating under different panel coordinators, would identify and define impacts that were essentially the same. An analysis would then be undertaken to determine whether there was a significant correlation between the weights assigned by the two panels to similarly defined impacts. To determine whether impact definitions produced by the two panels were sufficiently similar so as to be interpreted in the same way, it was necessary for the three authors independently to compare the definitions, and separately to indicate which impacts corresponded and which had no counterpart. The authors then conferred to see whether they were in agreement or not. Documents giving background information on the environmental characteristics of the site, the proposed housing development scheme, and local objections to the proposal were sent to all panelists for review before the meeting.

At the same time, two environmental scientists who were intimately familiar with the Infanta area and experienced in the field of EIA were commissioned to conduct independent evaluations of the proposed scheme. Both experts were provided with the same briefing documents given to the panelists. After visiting the site each expert was asked to identify and define impacts that could result from the development and then to submit a brief report discussing the relative significance of these impacts.

### **Application of PEM**

The two panels convened under similar circumstances and were briefed and given a site visit by the project coordinator. At each site visit, panel members were encouraged to ask questions and take notes that would be useful in formulating impact definitions. The project coordinator and panelists were allowed to give only factual responses to questions asked, and no discussion on impacts that could result from the project or any judgments regarding the suitability of the proposed development scheme were allowed.

**TABLE 2.** Extract from Synthesized Negative Impact Definitions

- 
- 1A. Seepage from rubbish dump and septic tanks could pollute groundwater supplies.
  - 1B. Pumping of groundwater could reduce the supply or quality of water.
  - 1C. The yield from boreholes may not be able to meet the demand at peak holiday periods.
  - 1D. Increased numbers of boats will place additional pressure on limited launching facilities at the Infanta slipway and bar harbour.
  - 1E. Additional tourists will create crowding and congestion on the Infanta beach.
  - 1F. Increased numbers of recreationists using the Infanta slipway and bathing area will result in conflict between different user groups and safety levels will be reduced.
  - 1G. Increased recreational craft using the estuary will create conflict between water users.
  - 1H. There will be an increase in the pressure on line fishing.
  - 1I. Increased bait collecting pressure will result in the disturbance of the fragile saltmarsh ecosystem.
- 

The evaluation tasks were guided by two different panel coordinators (each assisted by a different person) but using the same general approach. This was done to ensure that the results of the second panel evaluation exercise would not be influenced by ideas or impacts generated by the first panel. In addition, the panel coordinator and panelists involved in the second evaluation were not informed of any of the results of the first exercise.

The panel members assembled in a meeting room and the tasks and techniques involved in conducting PEM were described to them. The first task assigned to the panelists was the identification of impacts. Each panelist was asked to identify, individually and without discussion, all project costs (or negative impacts) and benefits (or positive impacts) and record them on separate color-coded forms. The panel coordinator and an assistant then systematically sorted through the impact forms and synthesized impact definitions (Table 2).

The synthesized list of positive and negative impacts was written out on large sheets of paper and posted around the meeting room, and panelists were requested to scrutinize the statements for completeness and accuracy. Panelists were asked to: (1) review the rephrased statements and check that all their impacts had been accurately reflected; (2) suggest whether any impacts should be further combined or separated; (3) suggest modifications to the wording of any statement; and (4) offer any additional impact statements that had not been previously identified. Suggestions were made anonymously and in writing, and the panel was then adjourned for the day while the panel coordinator and assistant reviewed the suggestions and drafted a revised list of impact definitions.

On the following morning, the panel convened and was presented with the revised impact definitions (Table 3). Panelists were given a final opportunity to modify the wording used to define the costs and benefits. The next step in the panel evaluation exercise was to rate the importance to society of incurring these costs and benefits. After three iterations of ratings for each list of positive and

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**TABLE 3. Extracts from Revised Impact Definitions.**


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*Positive Impacts***Better infrastructure and services**

The reservoir would provide an improved water supply to the existing Infanta residents.

Amenities such as shops may be built.

The road to Infanta in the village may be upgraded.

The removal of the rubbish dump to a more remote area will reduce the health hazard and be less visible to local residents.

The inclusion of the area in the Electricity Supply Commission (ESCOM) system could become a viable proposition by an increase in users.

*Negative Impacts***Recreational congestion**

Increased numbers of boats will place additional pressure on the limited launching facilities at Infanta slipway and harbour.

Additional tourists will create overcrowding and congestion on the Infanta beach and slipway, which will result in conflict between different user groups.

Increased number of recreational craft using the estuary will create conflict between water users.

Congestion on the commonage will worsen with increased number of fishermen using this area to park vehicles and trailers. This will result in a loss of open space for picnickers.

---

negative impacts, panelists were asked to rank the impacts individually and in order of importance and then evaluate their relative significance.

**Results**

An analysis and comparison of the responses received from the two panels showed a remarkable degree of correspondence with respect to the identification of impacts that could result from the proposed project. Although the two panels were basically agreed as to which impacts would result from the project, there were differences in the wording of the impact definitions. In some cases one panel would define as two impacts (and in one instance even more) what the other panel had defined, in more general terms, as one impact. In order to assess whether IIT produced replicable results, the two panel coordinators plus a third research associate independently judged the degree of similarity between the lists of impacts generated by the two groups. All three assessors were essentially in agreement as to which impact definitions of the two panels corresponded and which had no counterparts or were not really comparable. A comparison of the initial lists generated by each panel (and synthesized by the respective panel coordinators) revealed a surprising lack of correspondence in impact identification and definition. Panel 1 listed three positive impacts and six negative impacts that were not listed by Panel 2, and Panel 2 listed three positive impacts and 16 negative impacts that were not listed by Panel 1. Perhaps even more surprising, however, was the high degree of correspondence

**TABLE 4: Extract from List of Equivalent Negative Impacts (Second Iteration)****IE + 1F = 2H: Losses to Marine and Estuarine Systems****1E Exploitation of marine resources**

Increased exploitation by tourists will further reduce the numbers of large edible shellfish and reduce the population of bait organisms.

There will be an increase in the pressure on line fishing resources.

**1F Disturbance of estuarine environment**

Increased numbers of boats being launched and anchoring in the estuary would adversely affect the saltmarshes and zoster beds. Increased bait collecting pressure will result in the disturbance of the fragile saltmarsh ecosystem. Additional skiboats using the estuary in the vicinity of the saltmarshes will increase sediment and bank disturbance.

**2H Biotic disturbances**

Marine and estuarine life will be subjected to greater disturbance and exploitation, e.g., bait organisms, shellfish, tidal pool organisms, fish, whales and waterfowl.

**II = 2D: Higher Rates and More Regulations****II Increased cost to local inhabitants and local authority**

The development may lead to a demand for a high level of services (e.g., tarred roads, water, electricity, sewerage), which would be expensive to local inhabitants and the local authority.

The cost of the reservoir may be forced on the local authority if the development fails. Services provided for the new township will result in additional costs to Infanta property owners.

**2D Rates and regulations**

Increased rates and new regulations would be imposed on residents by local government for providing services and maintenance of facilities (e.g., tidal pool) beyond what is presently wanted or required.

between the panels that developed subsequently in the revised lists (Table 4). After this second iteration, all of Panel 1's positive impacts were listed by Panel 2, and only three relatively insignificant positive impacts listed by Panel 2 were not listed by Panel 1. In addition, each panel identified all but one (relatively insignificant) negative impact listed by the other panel.

The two experts, on the other hand, produced lists that were, in the judgment of the three research associates, not as comprehensive, well-defined, or well-ordered as those of the panels. Some of the impact definitions were too broad or general, others overlapped or were repetitious, and several were rather ambiguous. One of the experts identified three positive and seven negative impacts, whereas the other identified eight positive and 20 negative impacts. Neither expert identified any additional impacts that may have been overlooked by the panels. They each failed to list impacts that the other had identified, and both omitted impacts (some major) that had been identified by the panels.

Because there was a high degree of correspondence between the final impact definitions produced by the two panels, it was possible to compare the significance assessments made by the two panels. Comparison of importance scores or weights

**TABLE 5.** Comparison of Weightings Assigned by Two Panels to Equivalent Impacts

**Positive Impacts**

Panel 1 impacts	Score		Panel 2 impacts	Score
1A	23	(-)	2A+2B	22
1B	23	(-)	2I	13
1C	26	(-)	2G	25
1D	4	(-)	2E+2F	10
1E	10	(-)	2D	18
1F	13	(-)	2K	5
—	0	(-)	2H	2
—	0	(-)	2J	3
—	0	(-)	2C	0

**Negative Impacts**

Panel 1 impacts	Score		Panel 2 impacts	Score
1A	15	(-)	2F	16
1L+1B	14	(-)	2G	9
1C	0	(-)	—	0
1H+1D+1J+1K	38	(-)	2A+2E+2I+2C	37
1E+1F	21	(-)	2H	18
1I	3	(-)	2D	10
—	0	(-)	2K	2
1G	9	(-)	2B+2J	9

was done by combining certain impact scores of one panel to make them comparable to the impact scores of the other panel. For example, because positive impact D of Panel 1 was judged to be equivalent to Impacts E and F of Panel 2, the latter impacts were summed and their combined score compared to the score given Impact D. The two modified lists and set of scores were then subjected to the Product-Moment Correlation test.

Table 5 presents a listing of the impacts (represented by letters) identified by Panel 1 with the comparable impacts identified by Panel 2, and their respective associated weights or importance scores.

The Product-Moment Correlation Coefficient for these scores was then calculated to be 0.84 for the list of positive impacts and 0.96 for the list of negative impacts (Table 6).

**Findings of the Case Study**

From this investigation we can conclude that two multi-disciplinary panels working independently can agree on the identity and nature of impacts that could

**TABLE 6.** Corrections of Adjusted Weighting Scores

Regression output	R <sup>2</sup>	Correlation
Positive impacts	0,70	0,84
Negative impacts	0,93	0,96
Combined lists	0,82	0,91

result from a proposed project. Furthermore, the results suggest that a coordinator should not influence panel judgment if he or she scrupulously follows PEM and is conscious of the need to play a facilitating role throughout the evaluation process. In addition, the findings indicate that judgments made by a multi-disciplinary group using a systematic evaluation (such as PEM) are more comprehensive, reliable, and accurate than those made by individuals, no matter how well-trained (in a particular discipline) or knowledgeable (of a particular area) the latter may be. This result endorses the findings of other researchers (Zajonc 1965; Seaver 1976; Bakus 1982) who have shown that judgments and decisions made by groups are generally closer to the correct value or result than judgments and decisions made by individuals.

One aspect of this exercise that did not follow a rigorous procedure and that may require further consideration and testing was the technique used to judge the degree of similarity of impacts generated by the two panels. Finally, PEM proved to be flexible and cost-effective in this application. One of the major advantages of PEM is the relatively short period required to produce useful results. The time taken to conduct this study and produce these results was approximately 1 month. The total cost of the exercise was approximately R2,000 although this excluded disbursements to experts, which would probably be required if professional consultants were to participate in PEM in order to assist decision-making.

The findings of this case study lend further support to the implementation of PEM, particularly in situations in which an urgent decision is required and a formal EIA cannot be undertaken because of a lack of time, resources, or information.

### Conclusion

Twenty years after NEPA, environmental evaluation is still as much an art as it is a science, and more rigorous evaluation procedures are needed to reduce subjectivity and bias. Group evaluations of contentious resource allocation proposals are likely to be considered more valid than evaluations by any single individual, provided that such evaluations are conducted following a formal procedure that has been shown to provide consistently replicable results, and provided that the group is made up of individuals who are regarded as objective, and who are respected by all concerned parties.

The method of environmental evaluation presented in this paper has been tested and shown to produce results that are highly replicable and may be

regarded as having a high degree of credibility. The method provided a rigorous and systematic approach to accomplishing three critical tasks, which are often neglected in CBA, EIA, and many other formal evaluation methodologies, namely, (1) generating a comprehensive list of well-defined impacts, (2) evaluating the relative significance of all impacts, and (3) applying evaluation criteria, in an explicit way, to select the preferred proposal. The use of iterative procedures in the forecasting and evaluation techniques that comprise the method ensure that all impacts are identified and clearly defined, and their significance is evaluated in a way that makes subjective value judgments explicit, both to the individual panelist and to others.

A major advantage of employing PEM is that the busy decision-maker can then carefully review the results of an independent evaluation to see whether he is in agreement, whether re-evaluation of some questions might be desired or whether different conclusions might be drawn. In this way, the decision-maker is not operating in a vacuum, he benefits from the experience and intuition of others; his attention is focused on the truly significant possible outcomes; he will not be unduly influenced by individuals with special interests who happen to have access to him; he might find his judgments substantiated and be able to cite support for his decision; he will be inclined to reconsider points carefully in which disagreement exists and, finally, he will feel compelled to justify his final decision and clearly explain his position when disagreement persists. All this is in the best interests of both the decision-maker and his constituency; PEM encourages the best use of the imperfect information that is available so that resource allocation decisions will be improved and better received by all concerned.

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