GUIDELINE FOR INVOLVING ECONOMISTS IN EIA PROCESSES

Edition 1

Issued by:
Provincial Government of the Western Cape
Department of Environmental Affairs and Development Planning
Utilitas Building, 1 Dorp Street
Private Bag X9086
Cape Town 8000
South Africa

Prepared by:
Hugo van Zyl
Independent Economic Researchers
P.O. Box 1015
Green Point 805, South Africa

Martin P de Wit
CSIR Environmentek
P.O. Box 320
Stellenbosch 7599, South Africa

Anthony Leiman
University of Cape Town: School of Economics
Private Bag
Rondebosch 7701, South Africa

Co-ordinated by:
CSIR Environmentek
P.O. Box 320
Stellenbosch 7599
South Africa

Contact person:
Frauke Münster
Tel: +27 21 888-2538
(fmunster@csir.co.za)

COPYRIGHT © Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning 2005. ALL RIGHTS RESERVED.

This document is copyright under the Berne Convention. Apart from the purpose of private study, research or teaching, in terms of the Copyright Act (Act No. 98 of 1978) no part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without permission in writing from the Department of Environmental Affairs and Development Planning. Likewise, it may not be lent, resold, hired out or otherwise disposed of by way of trade in any form of binding or cover other than that in which it is published.

This guideline should be cited as:

ACKNOWLEDGEMENTS

Steering committee:
Paul Hardcastle - DEA&DP
Ayub Mohammed - DEA&DP
Susie Brownlie - deVilliers Brownlie Associates
Keith Wiseman - City of Cape Town
Mike Burns - CSIR Environmentdek
Paul Lochner - CSIR Environmentdek
Pete Ashton - CSIR Environmentdek

Focus group participants:
Paul Hardcastle - DEA&DP
Gerhard Gerber - DEA&DP
Toufeca Gamieldien - Department of Economic Development and Tourism
Portia Ngwenya - Industrial Development Corporation
Barry Standish - University of Cape Town
Paul Lochner - CSIR Environmentdek
Frauke Münster - CSIR Environmentdek

Internal review:
Mike Burns - CSIR Environmentdek
Paul Lochner - CSIR Environmentdek
Gerhard Gerber - DEA&DP

Stakeholders engaged in the guideline development process:
These guidelines were developed through a consultative process and have benefited from the inputs and comments provided by a wide range of individuals and organizations actively working to improve EIA practice. Thank-you to all of you who took the time to engage in the guideline development process.

Finalisation of report figures and formatting:
Magdel van der Merwe and Elna Logie, DTP Solutions
For Environmental Impact Assessment (EIA) processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add value to project planning and design;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply adequate and appropriate information that addresses key issues and concerns to effectively inform decision-making in support of sustainable development.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. They aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process was appropriate for the type of development and environmental context.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

<table>
<thead>
<tr>
<th>ISSUES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMING</td>
<td>When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?</td>
</tr>
<tr>
<td>SCOPE</td>
<td>Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement?</td>
</tr>
<tr>
<td></td>
<td>What are appropriate approaches that specialists can employ?</td>
</tr>
<tr>
<td></td>
<td>What qualifications, skills and experience are required?</td>
</tr>
<tr>
<td>QUALITY</td>
<td>What triggers the review of specialist studies by different roleplayers?</td>
</tr>
<tr>
<td></td>
<td>What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?</td>
</tr>
</tbody>
</table>

The following guidelines form part of this series:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input into the EIA process
PREFACE

- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The Guideline for determining the scope of specialist involvement and the Guideline for the review of specialist input provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focussed on specific specialist disciplines.

It is widely recognized that no amount of theoretical information on how best to plan and co-ordinate specialist inputs as an EIA practitioner, or to provide or review specialist input, can replace the value of practical experience of co-ordinating, being responsible for and/or reviewing specialist studies. Only with such experience can the EIA practitioner and specialist develop sound judgment on such issues as the level of detail needed or expected in specialist input to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents; their intention is to provide best practice guidance only.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financing institutions and other interested and affected parties involved in EIA processes.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether this is undertaken during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning/screening) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). The guidelines promote early, focussed and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that they may be avoided through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.
**What will these guidelines not do?**

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

The guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modelling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken as this influences both the approach and the methods available and used by specialists.

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A**: Background;
- **Part B**: Triggers and key issues;
- **Part C**: Planning and co-ordination of specialist inputs (drawing up Terms of Reference);
- **Part D**: Providing specialist input;
- **Part E**: Review of specialist input; and
- **Part F**: References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.
Summary

The purpose of this guideline is to improve consistency in the quality of compilation, assessment and evaluation of economic assessments conducted as part of the EIA process in order to support informed decision-making for sustainable development. It provides clear guidance as to when economic assessments should be carried out; which aspects must be addressed within the economic assessment; and specific criteria against which economic assessments can be measured to ensure that the assessment meets a set of minimum requirements, is reasonable and objective and is theoretically sound.

The basic function of the economic specialist is to determine whether a project or policy will enhance net societal welfare. At a broad level, investigating impacts on overall welfare requires considering the efficiency, equity and sustainability of the project. Keeping these principles in mind, the core concept applied by the economist when considering trade-offs is ‘opportunity cost’ - the net benefit that would have been yielded by the next best alternative.

The key issues that need to be addressed by the specialist can be summarized as follows:

- Financial viability or justification for the project in the case of public sector projects that don’t necessarily require financial viability (e.g. roads, housing projects and other public infrastructure)
- Distortions that lead to financial viability, but are not to the benefit of wider society creating a false ‘viability’ when seen from a broader perspective
- Environmental externalities that are not accounted for in costs and benefits
- Degree of fit with economic development planning in the area (i.e. does the project compliment economic and spatial plans)
- Linkage effects that allow a project to generate added benefits in the form or employment, incomes, increased production
- Macro-economic risks (i.e. whether the project has the potential to change exchange rates, interest rates or local factor and product prices)

It need to be borne in mind that, with the exception of macro-economic risks that only apply to large projects, these key issues can arise for all different types and scales of development in different biophysical, social and economic contexts. Whether the assessment covers all of the potential issues mentioned above will be influenced mainly by the size of the proposed project and the nature of its impacts. A layered approach to assessment that follows the principles of cost benefit analysis is thus advocated with elements being added as required, as illustrated below:
A number of tools or techniques are available to the economic specialist including opportunity cost analysis, financial and economic cost benefit analysis, environmental economic valuation techniques, input-output analysis, social accounting matrices, and computable general equilibrium modeling. Not all impacts can be assessed using these techniques – here, it is the economist’s responsibility to choose and/or devise ways to assess impacts that are theoretically defensible.
Impacts need to be assessed with and without mitigation. Ideally mitigation should be required up to the point where the project is at least positive on balance from an economic perspective (i.e. benefits exceed costs). Further mitigation beyond this point may lead to additional environmental benefits, but will come at a higher economic cost.

Economic specialist studies have the potential to add substantial value to the EIA process provided they are carried out when appropriate, address pertinent questions and maintain a high standard of analysis. In this sense they are no different to other specialist studies. In addition to these requirements, their success is reliant on a high degree of integration with the other specialist studies upon which they rely for inputs. These inputs are particularly critical with respect to environmental externalities.

It is intended that this guideline will prove to be a valuable resource for specialists, environmental assessment practitioners, authorities and the public with an interest in economic specialist studies.
A synopsis may be added in the final guideline.
# CONTENTS

- **ACKNOWLEDGEMENTS.................................................................i**
- **PREFACE......................................................................................ii**
- **SUMMARY ....................................................................................v**
- **SYNOPSIS ................................................................................... viii**
- **CONTENTS..................................................................................ix**

## PART A : BACKGROUND  

1. **INTRODUCTION**  

2. **PRINCIPLES AND CONCEPTS UNDERPINNING ECONOMIC SPECIALIST INPUT**  

3. **CONTEXTUALISING ECONOMIC SPECIALIST INPUT**  
   3.1 **LEGAL, POLICY AND PLANNING CONTEXT FOR ECONOMIC ASSESSMENT**  
   3.2 **ENVIRONMENTAL CONTEXT FOR ECONOMIC ASSESSMENT**  

4. **THE ROLE AND TIMING OF ECONOMIC SPECIALIST INPUT WITHIN THE EIA PROCESS**  

## PART B : TRIGGERS AND KEY ISSUES  

5. **TRIGGERS FOR ECONOMIC SPECIALIST INVOLVEMENT**  

6. **KEY ISSUES REQUIRING ECONOMIC SPECIALIST INPUT**  

## PART C : PLANNING AND COORDINATION OF SPECIALIST INPUTS (DRAWING UP THE TERMS OF REFERENCE)  

7. **QUALIFICATIONS, SKILLS AND EXPERIENCE REQUIRED**  

8. **DETERMINING THE SCOPE OF ECONOMIC SPECIALIST INPUTS**  
   8.1 **RESPONDING TO ISSUES RAISED DURING THE SCOPING PROCESS**  
   8.2 **ESTABLISHING APPROPRIATE TIME AND SPACE BOUNDARIES**  
   8.3 **SELECTING APPROPRIATE DEVELOPMENT ALTERNATIVES**
8.4 ESTABLISHING ENVIRONMENTAL AND OPERATING SCENARIOS
8.5 DEALING WITH DIRECT, INDIRECT AND CUMULATIVE EFFECTS IMPACTS
8.6 SELECTING THE APPROPRIATE APPROACH
8.7 TIMING, SEQUENCING AND INTEGRATION OF SPECIALIST INPUTS

PART D: PROVIDING SPECIALIST INPUT

9. INFORMATION REQUIRED TO PROVIDE ECONOMIC SPECIALIST INPUT
9.1 RELEVANT PROJECT INFORMATION
9.2 INFORMATION DESCRIBING THE AFFECTED ENVIRONMENT
9.3 THE LEGAL, POLICY AND PLANNING CONTEXT
9.4 INFORMATION GENERATED BY OTHER SPECIALISTS IN THE EIA PROCESS

10. INPUT ON IMPACTS AND MANAGEMENT ACTIONS
10.1 PREDICTING POTENTIAL IMPACTS
10.2 DEFINING IMPACT ASSESSMENT CRITERIA
10.3 ESTABLISHING THRESHOLDS OF SIGNIFICANCE
10.4 DESCRIBING THE DISTRIBUTION OF IMPACTS
10.5 IDENTIFYING KEY UNCERTAINTIES AND RISKS
10.6 RECOMMENDING MANAGEMENT ACTIONS
10.7 IDENTIFYING THE BEST PRACTICABLE ENVIRONMENTAL OPTION
10.8 COMMUNICATING THE FINDINGS OF THE IMPACT ASSESSMENT

11. MONITORING PROGRAMMES

PART E: REVIEW OF SPECIALIST INPUT

12. EVALUATION OF SPECIALIST INPUT

13. REFERENCES

14. USEFUL RESOURCES
Appendices

Appendix A: Definitions and Acronyms ................................................................. 34
Appendix B: Model terms of reference for Economic Assessment ......................... 36

List of figures

Figure 1: Economic principles and concepts in EIA ................................................. 2
Figure 2: Economic specialist involvement in the EIA process .............................. 7
Figure 3: The economic impact assessment process .............................................. 22
Figure 4: Potentially applicable techniques for economic impact assessment ........... 23

List of tables

Table 1: Steps in cost benefit analysis ..................................................................... 24

List of boxes

Box 1: Defining common impact assessment terminology ........................................ 3
Box 2: A brief description of the environmental context for economic assessment in the Western Cape 6
Box 3: Definitions and components of direct, indirect and cumulative effects .......... 14
Box 4: What to do in data poor circumstances ...................................................... 18
Box 5: Criteria used for the assessment of impacts ............................................... 27
ECONOMIC SPECIALIST GUIDELINES

PART A : BACKGROUND

1. INTRODUCTION

While the quality of economic specialist inputs to EIAs in South Africa have improved with time, there is certainly room for further improvement particularly in respect of unclear or inappropriate terms of references (TORs), inconsistency in the type of analysis undertaken and integration with other specialist studies.

Some EIAs proceed with TORs that call for economic specialist studies focusing only on micro-economic or macro-economic issues, others on micro and macro issues combined. In addition, socio-economic impact studies have become more commonplace requiring the combining of social and economic impacts in one report. This profusion of approaches relative to other specialist study areas has lead to unnecessary confusion and has lessened the efficacy of economic inputs in EIAs.

Aside from the confusion created by the various ways in which economic impacts are assessed there is also some difficulty in establishing consistency in terms of what is to be expected from economic specialist studies (i.e. what are the questions that regularly need to be addressed in economic specialist studies?). Some studies have a macro-economic focus, stressing linkages between the project and the remainder of the economy. Although environmental externalities may affect other economic sectors, their absence from the basic tools of macroeconomic impact assessment means that they are easily ignored. On the positive side, the national accounts of Namibia, Botswana and South Africa are currently being amended to include 'satellite accounts' that capture natural resource depletion.

The phrasing of terms of reference can be an unexpected problem leading to narrow interpretations of what is required. Everyday terms may have a specialist meaning for the economist. Thus should they specify a ‘cost benefit analysis’, (which certainly sounds as if it should include all relevant costs and benefits) it is almost certain that there will be little consideration of multiplied impacts on economic variables (since cost benefit studies follow a relatively standard format which generally excludes multiplier impacts). The same outcome might follow if they direct the economist to focus narrowly on direct local economic impacts.

For these reasons, the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) has embarked on the process of developing a guideline for economic specialist inputs during the course of the EIA process.
2. PRINCIPLES AND CONCEPTS UNDERPINNING ECONOMIC SPECIALIST INPUT

The basic function of economic specialist input is to assist in the determination of whether a project or policy will enhance net societal welfare. This necessitates the analysis of impacts on different sectors or groups that make up society including, for example, those defined by income levels and place of residence. At a broad level, investigating impacts on overall welfare requires considering the **efficiency**, **equity** and **sustainability** of the project. It is important that all three of these aspects are considered in order to provide adequate information to decision makers. It is, for example, not enough to simply assess efficiency without any regard for the distribution of impacts (equity) or vice versa.

Keeping these principles in mind, the core concept applied by the economic specialist (who is an experienced professional economist) is 'opportunity cost'. This is the net benefit that would have been yielded by the next best alternative. It is applicable to project alternatives as well as policy selection. It is vital information if decision makers are to understand the trade-offs involved in projects. A key part of considering opportunity costs is commonly to highlight the impacts of doing nothing.

Opportunity cost is a concept that often need not involve monetary values, though where these values can be given, they allow a breadth of comparison that would otherwise be denied. They provide a yardstick familiar to all, and identical to that used for all other costs and benefits of projects. For this reason there is a tendency to conflate economic practice with valuation - the two may overlap, but are certainly not identical.

Figure 1 below summarizes the basic principles and concepts that need to be borne in mind with regard to economic specialist inputs. It shows how efficiency, equity and sustainability combine to impact on societal welfare and how trade-offs need to be made between these issues, taking cognizance of opportunity costs.
Further common terminology used in impact assessments is highlighted in Box 1.

**Box 1: Defining common impact assessment terminology**

The following definitions aim to clarify common EIA terms and concepts:

- **Environmental impact assessment**: A public process that is used to identify, predict and assess the potential positive and negative environmental impacts of a proposed project on the biophysical, social and economic environment and to propose appropriate management actions and monitoring programmes. The EIA process is used to inform decision-making by the project proponent, relevant authorities and financing institutions. The process includes the following components: pre-application planning, screening, scoping, impact assessment (including the identification of management actions and monitoring requirements), integration and decision-making.

- **Pre-application planning**: The process of identifying and incorporating environmental opportunities and constraints into the early stages of project planning and design, prior to the submission of an application for environmental authorization. This includes the identification of potential fatal flaws and negative impacts of potentially high significance, as well as the identification of alternatives and management actions that could prevent, avoid or reduce significant impacts or enhance and secure benefits. This process is sometimes referred to as “pre-application screening”, “positive planning” or “fatal flaw assessment”.

- **Screening**: A decision-making process to determine whether or not a development proposal requires environmental assessment, and if so, what level of assessment is appropriate. Screening is usually administered by an environmental authority or financing institution. The outcome of the screening process is typically a Screening Report/Checklist.

- **Scoping**: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose is to focus the environmental assessment on a manageable number of important questions on which decision-making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

- **Impact assessment**: Issues that cannot be resolved during scoping and that require further investigation are taken forward into the impact assessment. Depending on the amount of available information, specialists may be required to assess the nature, extent, duration, intensity or magnitude, probability and significance of the potential impacts; define the level of confidence in the assessment; and propose management actions and monitoring programmes. Specialist studies/reports form the basis of the integrated Environmental Impact Report which is compiled by the EIA practitioner.

- **Trigger**: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development.

- **Root cause/source of impact**: A description of the aspect of the development that will result in an impact on the biophysical, social or economic environment (e.g. atmospheric emissions from industrial stacks);

- **Issue**: A context-specific question that asks “what will the impact of some activity/aspect of the development be on some element of the biophysical, social or economic environment?” (e.g. what is
3. CONTEXTUALISING ECONOMIC SPECIALIST INPUT

3.1 LEGAL, POLICY AND PLANNING CONTEXT FOR ECONOMIC ASSESSMENT

3.1.1 National

At a national level there is no single unified economic development or planning policy relevant to economic assessment. In a very broad sense one can say that the key economic priority is poverty alleviation through job creation, following a free market system and targeted government intervention. This priority is reflected in the Reconstruction and Development Programme (RDP) and the Growth, Employment and Redistribution (GEAR) strategy. It is also shared by inter-governmental bodies such as the New Partnership for Africa’s Development (NEPAD) secretariat and a number of departments each with their own policies. These include the policies of departments that are more narrowly focused on supporting economic development through the initiation, support and regulation of projects on the ground. Those that play the most direct role in this regard include Trade and Industry (in particular with its Spatial Development Initiatives - SDIs that promote economic development of a particular profile in defined geographic areas), Transport, Minerals & Energy, Public Works and Environment & Tourism. The Other departments such as Education, Health and Social Welfare are involved in economic development, but tend to have less to do with ground-level projects requiring EIAs.
Each department has its own agenda and philosophy towards sustainable economic development, which is not surprising given its broad objectives. It is also not surprising that the policies and approaches of the government departments involved can come into conflict. For example, in the case of dune mining in St. Lucia, the Department of Minerals and Energy may have supported mining as a development option while the department of Environmental Affairs and Tourism favoured eco-tourism development. This kind of situation makes it difficult for the economist who may be forced to come out in support of one or another policy. Ideally, the economist should stick narrowly to rigorous economic analysis and avoid making policy judgements that are better made by the relevant decision makers. This difficulty also arises at a regional and local level where economic and spatial development frameworks might be unclear or are in conflict. This conflict is not something the economist should be expected to remedy while doing a specialist study as it is a form of policy failure best dealt with by the relevant policy makers.

3.1.2 Western Cape

The Department of Economic Development and Tourism is the primary provincial government body tasked with economic development issues. The mandate of the department calls for, among other things, “stimulating significant economic growth; reducing unemployment; increasing participation in the ‘first economy’ by those consigned by historical circumstances to the province’s ‘second’ economy; developing and enhancing micro, small and medium enterprises and co-operatives; promoting broad-based economic empowerment for black people, women, those living with disabilities, workers, those living in rural areas; ensuring that the benefits of a growing economy are spread equally across the province; defending, building, transforming and growing selected sectors of the economy, with a significant emphasis on the tourism sector; positioning the province to retain and enhance its positive position in the global economy.” (PGWC, 2004). The Department’s strategic plan mentions that ideally the work of the department should flow out of an all-embracing micro-economic strategy which, in turn, should flow from a comprehensive and fully integrated socio-economic development plan for the Province.

The Department of Environmental Affairs and Development Planning in the provincial government is also significantly involved with development on the ground particularly through its formulation of the Provincial Spatial Development Framework (PSDF). Both of these departments have strategic plans that focus more on departmental actions which are updated periodically. ¹

¹ The provincial government information dissemination website (www.capegateway.gov.za) should keep those interested informed of economic development policies.
3.2 ENVIRONMENTAL CONTEXT FOR ECONOMIC ASSESSMENT

Specialist assessments need to take into account the specific nature of the biophysical, social and economic environment within which they are undertaken. Box 2 provides a brief description of the environmental context for economic assessment in the Western Cape.

**Box 2:** A brief description of the environmental context for economic assessment in the Western Cape

The economy of the Western Cape grew by an average of 3.3% between 1995 and 2001 growing faster than the national economy until 1999 and slowing thereafter. The provincial economy has also undergone significant restructuring in the last decade with tertiary industries growing much faster than primary and secondary ones. While a similar trend towards tertiary industries has occurred at a national level, it has been significantly more pronounced in the Western Cape. The share of agriculture in provincial production may be declining, yet the sector is labour intensive and provides 14% of formal jobs in the economy.

The growth in tourism related sectors (i.e. Transport, Restaurants and Hotels) indicates a significant contribution of tourism to the provincial economy. This sector continues to enjoy focused government support particularly because of its employment creation potential. The majority of tourists are attracted to the province because of its natural beauty, emphasizing the economic importance of the conservation of natural assets. Aside from the importance of a well-functioning natural environment for tourism, recreation and aesthetic beauty, it also provides numerous valuable ecosystem services such as nutrient cycling, water regulation and pollination that support the economy.

The general level of welfare in the Western Cape as reflected in income, employment and education levels is higher than the average for South Africa yet there are pockets of extreme poverty. Rural areas in particular are generally more likely to have stagnant economies that are not able to provide adequate opportunities. Population growth especially from in-migration is relatively high and the growth of coastal cities and towns continues to exceed that of inland areas. As with the rest of South Africa, urbanization is a prominent development trend often leading to significant stresses on services.

*Statistics sourced from WC Provincial Treasury (2003)*

4. THE ROLE AND TIMING OF ECONOMIC SPECIALIST INPUT WITHIN THE EIA PROCESS

The involvement of the economic specialist at all stages of the EIA process can go a long way towards identifying important issues and placing the correct amount of focus on specific issues as well as providing inputs on project alternatives and design. This should contribute to making the EIA more effective as well as expeditious. Figure 2 below outlines the economic specialist’s potential areas of involvement in the EIA process.
At the pre-application planning stage, the economist can help with the early identification of negative economic impacts (such as opportunity costs, distortions and externalities all of which are explained in section 10.1) and the preliminary assessment of their likely implications. This can help to point out pitfalls and steer the project towards greater economic acceptability thus cutting down on the need for reactive changes later on. In a sense this exercise tries to anticipate economic impacts given limited information and time a task best performed by a more experienced economist with a systems understanding of development and its impacts.

At the scoping stage, the economist can deal with certain issues and identify those that require further study in a full EIA specialist study. This should be done in consultation with the EIA practitioner whose responsibility includes sourcing input on issues from Interested and Affected Parties (I&APs) that can be shared with the economist. Economists should use their training and experience with similar projects to identify any other issues that I&APs may not have identified.

The need to guide the process concerning which issues do not require further study beyond the scoping level, is just as important. This is often more difficult than identifying issues, particularly given that little may be known about impacts at a scoping level. The specialist needs to exercise caution in this regard and only recommend that an issue be left out of further study when they are confident that it will have little bearing on the project decision or management path. Once scoping is complete, the economic specialist is needed to conduct the EIA economic specialist study.

Although they are seldom initiated, the economist can also contribute to post project appraisals. These analyses focus on assessing whether projects had the impacts that were predicted, thereby providing a form of audit for the predictions made during the EIA.

<table>
<thead>
<tr>
<th>Stage of EIA</th>
<th>Role of economic specialist</th>
<th>Level of detail required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-application planning</td>
<td>Advise on potential negative impacts, opportunity costs and their implications</td>
<td>Low</td>
</tr>
<tr>
<td>Scoping</td>
<td>Identify potential issues, assess those that can be assessed and advise on those needing further study</td>
<td>Medium</td>
</tr>
<tr>
<td>Full EIA</td>
<td>Impacts identified and assessed in a full specialist study</td>
<td>High</td>
</tr>
<tr>
<td>Monitoring and management</td>
<td>Post-project approval economic performance assessed</td>
<td>Medium</td>
</tr>
</tbody>
</table>

*Figure 2: Economic specialist involvement in the EIA process*
PART B : TRIGGERS AND KEY ISSUES

5. TRIGGERS FOR ECONOMIC SPECIALIST INVOLVEMENT

The scoping phase should provide guidance from I&APs on whether their concerns are economic in nature and thus should be considered for assessment in an economic specialist study. Whether they should indeed be assessed needs to be determined in discussion between the EIA practitioner and the economic specialist, taking care to strike a balance between providing information to I&APs while at the same time avoiding unnecessary study. If there is a chance that economic impacts are likely to influence the decision on whether a project is desirable on balance and/or influence the development path selected for the project, an economic specialist study should be initiated. Determining this can be challenging as most projects from the smallest to the largest will lead to some form of economic impact. If anything, larger projects tend to lead to greater economic impacts due to their extent having a greater chance of leading to more significant opportunity costs. In addition, larger projects are often associated with greater levels of expenditure in the economy and larger employment requirements. However, this does not mean that smaller projects do not require economic assessments.

The need for economic input as part of an EIA is also a function of the nature and timing of the project development planning process. Three alternative tracks are recommended:

- If no previous economic feasibility studies have been conducted, an economic assessment is certainly needed. If the opportunity costs of not developing have not been highlighted earlier, economic specialist studies do play the important role in assessing also the positive impacts in the form of job creation, etc. This tends to increase the importance of their inclusion in EIAs in order to ensure that a more balanced assessment is given for a project.
- If there are valid questions regarding economic feasibility studies that might have been performed earlier in the project development cycle, or when an independent study is needed, an economic specialist study can be used as a “second opinion”.
- If previous economic feasibility studies have been performed and are acceptable, the added value of an additional economic specialist study needs to be considered carefully before commissioning such a study.

The following are indicators that could suggest the need for economic specialist input, based on the nature of the receiving environment and the nature of the project.

The nature of the receiving environment:
- Areas containing vulnerable communities;
- Areas where local livelihoods depend on environmental resources;
Areas where ecosystems provide valuable services;
Protected areas or areas with intact wilderness qualities, or pristine ecosystems;
Areas of important tourism or recreation value.

The nature of the project:
- Large, high intensity type projects (e.g. large infrastructure)
- Projects conceived because of their perceived strategic economic benefits (e.g. new roads, ports, industrial development areas, etc.)
- Projects requiring a large workforce relative to the size of the existing workforce in the area;
- Projects that are likely to change spending patterns in an area (e.g. a toll road in a rural area);
- A change in land use from the prevailing use;
- A land use that is in conflict with an adopted plan or vision for the area.

5.1.1 Timing of specialist assessment within the EIA process

The parts of the economic specialist study that do not deal with environmental externalities, can be done parallel to other specialist studies and no specific timing issues need to be considered. However, sequencing becomes important if the output of other specialist studies are needed by the economic specialist. For example, in order to assess the economic impacts of water pollution on downstream users, the results of the pollution specialist study are required first. Agreement is needed between the EAP and specialist on timing before the economist commences with work.

6. KEY ISSUES REQUIRING ECONOMIC SPECIALIST INPUT

In order to focus the EIA process and avoid the generation of excessive amounts of irrelevant information, "issues-focused scoping" is commonly used in South Africa to determine the scope of the EIA and focus the assessment on key issues that will affect decision making. Issues that cannot be fully addressed or resolved during the scoping process are taken forward into the impact assessment process and are addressed through the input of various specialists. For the economic specialist this means asking (at the very least) whether:

- The project is financially viable and/or justifiable?
- The project remains financially viable and/or justifiable once distortions are taken into account (see section 10.1 for an explanation of this concept)?
- Alternative forms of the project (incl. the no-go) would be more economically efficient?

Key issues are informed by the principles and concepts outlined in section 2. This means that issues relating to efficiency, equity and sustainability need to be addressed. The principle of efficiency raises the issue of whether alternative forms of a project would constitute a more efficient use of resources. In other words, can the objectives of the project be achieved more
efficiently (i.e. faster, cheaper, more effectively, with less waste, etc.) with a re-alignment of the elements of the project or even a totally different project? An example for an industrial project may be changing a process to use less energy or using a by-product for manufacturing instead or disposing of it. The equity principle requires the consideration of whether the project results in outcomes that can be considered ‘fair’. Investigating the distribution of impacts is required here clearly indicating who is impacted on, in what way and for what period. A toll road development that proposes the establishment of a plaza with established negative side-effects on a nearby small community without offering discounts to locals would be an example of an inequitable situation. Sustainability related issues include a consideration of whether the project is likely to be financially viable over the long term and whether it will be ecologically sustainable. Risks to the long term success of the project including factors such as changing interest rates, exchange rates and others become important here.

The key issues that need to be addressed by the specialist can be summarized as follows (these impacts are described in more detail in section 10.1):

- Financial viability or justification for the project in the case of public sector projects that do not require financial viability (e.g. roads, housing projects and other public infrastructure)
- Distortions that lead to financial viability, but are not to the benefit of wider society creating a false ‘viability’ when seen from a broader perspective
- Environmental externalities that are not accounted for in costs and benefits
- Degree of fit with economic development planning in the area (i.e. does the project compliment economic and spatial plans)
- Linkage effects that allow a project to generate added benefits in the form or employment, incomes, and increased production
- Macro-economic risks (i.e. whether the project has the potential to change exchange rates, interest rates or local factor and product prices)

It needs to be borne in mind that, with the exception of macro-economic risks that only apply to large projects, these key issues can arise for all different types and scales of development in different biophysical, social and economic contexts. For example, an industrial development can require the assessment of all these issues regardless of its intended location and the same applies to other types of developments. For this reason a sequential approach is advocated for all types of developments in all contexts. A flow-chart representing this approach and spelling out important decisions that need to be made with regard to which issues need to be assessed is further discussed in section 10.1 – this chart gives guidance on “when to do what.”
PART C : PLANNING AND COORDINATION OF SPECIALIST INPUTS (DRAWING UP THE TERMS OF REFERENCE)

7. QUALIFICATIONS, SKILLS AND EXPERIENCE REQUIRED

Economic specialist studies should only be conducted by specialists that have developed a substantial base of knowledge in economic project assessment as related to development decision making. While the requirements for research assistants need not be stringent beyond graduate economic study, the lead specialist should ideally have a recognized degree preferably to a masters level or higher as well as several years of experience. For less complex projects, an honours level degree in economics with demonstrated experience in project evaluation would also suffice. In addition to qualifications and experience, the specialist should also enjoy good standing among his or her peers in the economics or ecological/resource/environmental economics communities. In the case where an environmental and resource economic study is needed, the same requirements hold in terms of qualification and experience, but most often economic specialists will not have these skills. The variety of sub-disciplines and techniques that the specialist needs to be familiar with implies that more often than not, teams of economists should be involved in specialist studies, particularly for larger projects. There are very few, if any, economist that have the requisite proficiency in financial viability analysis, social cost benefit analysis, environmental valuation and macro-economic modeling to attempt a specialist study unaided. Aside from a potential lack of skills in one person, the nature of economic research ideally requires discussion among a team of at least two colleagues to ensure adequate outputs.

8. DETERMINING THE SCOPE OF ECONOMIC SPECIALIST INPUTS

8.1 RESPONDING TO ISSUES RAISED DURING THE SCOPING PROCESS

The Scoping Report should be consulted by the specialist in order to ensure that issues raised are addressed in the assessment. The specialist is not necessarily required to assess each issue raised in scoping; a comment on why the issue is not relevant may suffice in some cases.
8.2 ESTABLISHING APPROPRIATE TIME AND SPACE BOUNDARIES

The extent of the area in which economic impacts will be felt will depend largely on the size and nature of the project. Large projects such as a new road, port or industrial development zone involving major expenditure have a greater chance of leading to impacts at a regional or national scale while those that are smaller will generally lead to local and possibly regional impacts. For example, a study of a new power station would have to consider national impacts, while that of an average housing estate would typically only need to consider local and sub-regional impacts.

Since most environmental impacts include externalities, how far to expand economic analysis of environmental impacts is an important issue. For example, in dealing with the impact of waste water, boundaries for downstream effects need to be agreed upon in conjunction with the EIA practitioner and the decision-making authorities. For example, should only the area immediately affected be included, or should downstream impacts on irrigation, fishing, and drinking water far away and often beyond national boundaries be accounted for? (Asian Development Bank, 2005).

All projects regardless of their size generally lead to local impacts. Impacts at this level are often of greatest importance as local people are the ones that are likely to be impacted on in the most direct sense. Often, it is local people in the immediate vicinity of a project who bear the brunt of environmental costs. It is also often, but certainly not always, locals that stand to gain most from benefits such as employment opportunities.

The timing of impacts depends on the nature of the project. The majority of projects have a construction, an operation or maintenance, and a decommissioning phase. The construction phase typically gives rise to intense impacts of a short term nature while the operation phase typically lead to medium to long term impacts, possibly, of a lower intensity than for construction. The decommissioning phase varies in its impacts.

8.3 SELECTING APPROPRIATE DEVELOPMENT ALTERNATIVES

Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives as well as the “do nothing” alternative. Any development proposal may include a range of possible alternatives from some or all of these various categories of alternatives. Fundamental alternatives such as changing demand or activity alternatives (e.g. whether energy needs should be met by gas, coal or nuclear) should ideally be addressed at a strategic assessment, policy and planning level. However, there may be a need for their consideration at the EIA level.

In the pre-application planning phase and scoping phase, the specialist should ideally be involved in assisting the project proponent in identifying the range of viable alternatives that need to be assessed in the specialist study.
The identification of alternatives at an EIA level is challenging but necessary. In the case of private sector investments, often only one alternative has been identified and tested for financial viability. In the public sector, bureaucrats or politicians may also only have one alternative in mind as others may fall beyond their spheres of power.

An understanding of the context within which the project is proposed will allow the specialist to contribute to the process of deciding on alternatives. Alternatives that are compatible with this context can then emerge for consideration. Some of these will be obviously worth considering such as eco-tourism development in natural environments without conservation restrictions and others obviously not worth looking at such as industry in the same kind of area.

Typically the scope for the consideration of real alternatives at an EIA level is limited to those that influence factors such as siting, routing, processes and other adjustments but not the actual nature of the proposed project (i.e. not alternative land uses). Integrated development planning frameworks supported by processes and tools such as Strategic Environmental Assessments (SEAs) are better suited to identifying land use alternatives as they are meant to occur at a stage when a preferred land-use alternative has yet to emerge. However, in the absence of such studies is it up to the economic specialist to consider land use alternatives in order to adequately address opportunity costs. When an applicant is planning a specific development one of the aspects to be addressed is the selection and securing of a suitable site.

Using a siting example, in the case of the location of a toll road plaza, the proponent may have earmarked a stretch of road for the plaza but may not have a preferred location along the stretch. The economist may then point out that a certain location is likely to be more favourable for farmers in the district as it would allow them to get to the town where they do the bulk of their business without paying a toll. Without an understanding of local farming conditions, this observation would be difficult to make.

8.4 ESTABLISHING ENVIRONMENTAL AND OPERATING SCENARIOS

The definition of possible scenarios that could influence the nature, extent, duration, intensity, probability and significance of impacts needs to facilitated by the EIA practitioner using information from the proponent. Definitions need to be detailed enough to convey what the project entails, but if the specialist is in doubt with regard to scenarios, clarification should be sought from the EIA practitioner and proponent.

8.5 DEALING WITH DIRECT, INDIRECT AND CUMULATIVE EFFECTS IMPACTS

The following box provides a useful definition of the different interpretations and components of cumulative effects. Section 10.1 on the prediction of impacts elaborates on different types of impacts.
### Box 3: Definitions and components of direct, indirect and cumulative effects

| **Direct (or primary) effects** | Occur at the same time and in the same space as the activity. For example, the loss of habitat through mining or the creation of permanent employment opportunities on the construction site. |
| **Indirect (or secondary) effects** | Can occur later in time, or at a different place, from the causal activity, or as a result of a complex pathway. For example, the establishment of a factory can lead to the establishment of other businesses using the outputs of the factory. |
| **Cumulative effects** | Can be: |
| 1. Additive: the simple sum of all the effects (e.g., the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource). |
| 2. Synergistic: effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g., the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area). |
| 3. Time crowding: frequent, repetitive impacts on a particular resource at the same time (e.g., boreholes decreasing the value of water resources). |
| 4. Neutralizing: where effects may counteract each other to reduce the overall effect (e.g., infilling of a wetland for road construction, and creation of new wetlands for water treatment). |
| 5. Space crowding: high spatial density of impacts on an ecosystem (e.g., rapid informal settlement). |

**Source:** Cooper, 2004.

Misinterpretation of cumulative effects on environmental values has the potential to make projects (particularly those that follow greenfields projects) seem artificially beneficial. For example, the loss in environmental value brought about by a greenfields project may be substantial. However, when a second or third project is proposed, these losses may be very low only because the first project has already decreased values by a large amount. This situation is best avoided by the setting of thresholds of acceptable environmental change in an area as part of the (preferably strategic) assessment of the first project proposed there. By doing this, subsequent projects can be assessed against a more realistic baseline and a situation where greenfields projects open up an area for sub-optimal levels of development can be avoided.

Ideally this process of determining acceptable limits of change should be done at a strategic planning level possibly as part of a Strategic Environmental Assessment or some other form of development planning process, such as the Integrated Development Planning processes. This allows for clear ‘rules’ to be set up front before any development takes place and allows for time to ensure that they are accepted and applied by the authorities responsible.

#### 8.6 SELECTING THE APPROPRIATE APPROACH

The potential involvement of the specialist at the pre-application planning and scoping levels is generally less formalized when compared to that for conducting of the economic specialist study to form part of an EIA. This is because it is not clear what level of inputs will be required by the EIA practitioner. For example, the EIA practitioner may have already made a preliminary
identification of issues and may only need brief input from a specialist to check whether there may be other issues not yet identified.

The basic recommended approach to the economic impact assessment is:

1. Outline the current economic context and desired future context within which the project would be established.
2. Identify impacts using professional judgement, inputs from other specialists and I&APs from scoping.
3. Assess impacts relative to the context with and without mitigation and complete the impact rating tables.

Step 1, outlining the context is discussed in sections 3 and 9.2. Identifying impacts (step 2) is discussed in section 10.1. The assessment of impacts (step 3 above) should proceed in a step-wise fashion with issues being identified or questions being asked in order to give the assessment structure and ensure that the pertinent issues are covered. Agreement is required between the EAP and specialist on an appropriate approach that addresses the key issues of the economic efficiency, equity and sustainability of projects (see section 2). Section 10.1 on predicting impacts outlines recommended approaches to assessment as well as the tools that can be used.

8.7 TIMING, SEQUENCING AND INTEGRATION OF SPECIALIST INPUTS

The key factor that will determine the timing of the economic specialist study in relation to the other specialist studies is whether and to what extent environmental externalities need to be assessed. As has been mentioned, if a reasonable chance exists that externalities are significant, they need to be analysed further by the economist. The need for further study can, however, only be determined once the other specialist studies are complete (or approaching this stage) as they will attach significance ratings to impacts and these will determine whether there is a need for further study. For example, the economist may suspect that the air pollution associated with a project will be significant, but it is only once the air pollution specialist study is complete that an informed judgement can be made on this impact. The implication for project timing is that while all other parts of the economic specialist study (i.e. those not dealing with environmental externalities) can proceed at the same time as the other specialist studies. Only if externalities are judged significant enough to stand a chance of outweighing net benefits does added time need to be allocated to further analysis by the economist. This eventuality needs to be clearly stipulated and accounted for in project planning done by the EAP.

An alternative, but at this stage not practical in South Africa yet, is the use of environmental shadow costs for expected environmental impacts. Based on a database on the environmental costs associated with similar developments as the one under assessment, the order of magnitude of environmental costs can be calculated, before any other specialist study has been carried out.
PART D : PROVIDING SPECIALIST INPUT

9. INFORMATION REQUIRED TO PROVIDE ECONOMIC SPECIALIST INPUT

9.1 RELEVANT PROJECT INFORMATION

Essential project information from the proponent includes:

- A reasoned motivation for why the project is being proposed
- An indication of expected financial viability and potential sources of risk
- Sources and terms of project financing.
- Total project expenditure on the project broken down into sectors and an indication of where goods and labour will come from.
- Expected direct employment on the project.

Other information may be needed from the proponent depending on the nature of the project. It is up to the specialist to determine what other information would be useful based on his or her understanding of the analysis that is required and request it from the proponent.

9.2 INFORMATION DESCRIBING THE AFFECTED ENVIRONMENT

An economic profile of the local area and region is needed to describe the affected environment in which the project may proceed. This profile should include information source by the specialist on:

- Demographics
- Unemployment
- Income levels
- The structure of the economy (i.e. what activities drives the economy, what sectors are prominent)
- Past, present and future growth trends and their sectoral make-up
- Land-use patterns on the site and in the surrounding area
- The desired future status of the area (goals and plans for the area)

Census data and household survey data can be used to construct this profile supplemented by Integrated Development Plans (IDPs) and other relevant regional, provincial and national policy
documents. Other sources of information could include academic studies conducted in the area. Information can also be requested or verified (in the case of older data) with the help of municipal and provincial officials involved in economic development planning.

In the case of large projects that will have clear macro-economic impacts, a profile of the parts of the macro-economy that are likely to be affected by the project is needed. For example, if a project will require substantial electricity which may have an influence on electricity prices and/or the timing of augmentation of generation capacity then a brief outline of the macro-economic issues surrounding electricity prices and provision is necessary.

Information on strategic environmental planning processes as well as expected environmental impacts of the particular project needs to inform an early decision whether to include an environmental economic study.

9.3 THE LEGAL, POLICY AND PLANNING CONTEXT

Information describing the affected economic environment should be supplemented by a brief summary of the economic policy, planning and natural resources context. The local and regional Integrated Development Plan (IDP) for the area should be consulted and possibly supplemented by spatial development plans or any other prominent economic development planning documents. In this regard, it is useful to contact the local municipal official responsible for economic development in order to check which documents are of relevance. Details on the state of and pressures on natural and environmental resources as well as any legal actions taken to protect these resources are needed to place the project in context.

9.4 INFORMATION GENERATED BY OTHER SPECIALISTS IN THE EIA PROCESS

Information on the significance and implications of environmental impact from the other specialists is critical for the assessment of environmental externalities. The nature of information needed will vary for each project depending on the issues that require assessment. For example, an assessment of a road project will generally require information on increased noise levels and potential traffic congestion while an assessment of an industrial plant will be more likely to require air and water pollution information coupled to information on health impacts. Data poor circumstances generally increase the difficulties associated with assessment. Box 4 below provides pointers on what to do in such circumstances.
Box 4: What to do in data poor circumstances

- Identify information gaps, associated risks and uncertainties
- If statistical data are not available, investigate the possibility of eliciting expert opinion. If this route is taken make sure that the experts you contact have no incentive to be biased and understand what you are asking. Try to get as may opinions as possible and exercise caution if they differ.
- Clearly spell out the assumptions that have been made and indicate what level of confidence is attached to them.
- Highlight the consequences of assumptions (which had to be made) being incorrect, as part of a sensitivity analysis.
- Do not be pressurised by EIA practitioners, proponents or decision makers to make predictions and pronouncements when levels of uncertainty are uncomfortably high. The primary role of the specialist is the provision of information as objectively as possible, not the making of decisions.

10. INPUT ON IMPACTS AND MANAGEMENT ACTIONS

Possible impacts should be assessed for the different alternatives, as well as for the range of risk situations and scenarios (including the worst case scenario), both with and without management actions.

10.1 PREDICTING POTENTIAL IMPACTS

Predicting impacts should proceed in a step-wise fashion with issues being identified or questions being asked sequentially in order to give the assessment structure and ensure that the pertinent issues are covered and at the appropriate stage. Below are a set of key issues that the economists need to identify and assess or comment on in their reports. Collectively, they address the economic efficiency, equity and sustainability of projects.

Does the project make financial sense or can it be justified for other reasons? Is the project financially justified? For private sector projects, economic impacts can only flow from projects that are financially viable and sustainable. There is thus a need to assess whether financial viability is likely before proceeding with any other analysis. Unfortunately the availability of information is a major potential pitfall for the economist wishing to provide a second opinion on the financial viability in an EIA. The proponent may not be willing to part with sensitive financial information. While this may be a source of frustration for the economist it is also understandable if the client wants to keep sensitive information out of the public realm. The EIA regulations also do not stipulate that all financial information be made available. If information is not forthcoming the economist has to look for ways of still completing a satisfactory analysis that
is less intruding. In the case of private projects, one way to do this is to assume that the proponents would not be attempting a project unless they were confident of financial gain to themselves. This places the burden of proof on them and possibly their auditors. A positive response suggests that the project is publicly (or economically) rather than just privately (or financially) viable. This allows the proponent to maintain confidentiality while carrying the burden of proof for viability. Of course this is not ideal as it does not allow for proper checks by the economist. It is, however, better than ignoring the issues altogether and at least there is still the opportunity for the economist to compare the rates of return claimed by the proponent with averages for that type of project. If the project seems to rely on financial returns well in excess of the average, explanations should be sought and scrutinised.

For public sector projects, some form of viability assessment should be more freely available from the government department concerned. However, this may not always take the form of a CBA that can be checked with relative ease, as CBA is not a requirement for government projects. For example, the project may have been proposed by government in order to meet a perceived urgent strategic need and CBA analysis may have been deemed unnecessary. In any event, some form of analysis or reasoning must have been applied to the decision to proceed with the project and it is this that the economist needs to understand even if CBA is not applied.

**Is the project economically worthwhile or justified?** Does the projects’ apparent financial viability result from missing or distorted markets, or implicit subsidies? In order to determine this a cost-benefit approach needs to be undertaken to determine whether the project will lead to net benefits for society as a whole, and which segments of society are losing and which are winning. Cost-benefit is locally and internationally (World Bank, UN, OECD, ADB) accepted as the main tool in determining the economic desirability of projects. It can basically be used to answer the question "does this project make economic sense, and if so to whom?"; i.e. is it viable at a private level? Is it still viable after correcting for state distortions (taxes, subsidies and tariffs)? Is it still viable after correcting for market distortions (monopoly, unfair competition)? Is it still viable after correcting for missing markets (externalities)?

Negative environmental externalities are environmental impacts that cause a decrease in the welfare of others that is not compensated for (for example, air pollution that leads to premature mortality or increased morbidity). One thus needs to ask **whether the environmental externalities associated with the project are significant enough to feasibly outweigh the projects net benefits?** If a reasonable chance exists that they do, they need to be analysed further. In the full economic specialist study this might mean attaching a value to the externalities in order to obtain true net benefits (see Box 5 below for an explanation of what is meant by externalities). Such issues tend to re-emerge in the course of an EIA. Consequently, the question should be asked again towards the end of the study. This allows for the possible extension of the CBA to include the valuation of environmental externalities using environmental economics techniques; however, more importantly, asking it at the end means that sometimes time consuming and resource intensive valuation exercises can be avoided if they are found to be unnecessary. The implication for project timing is that the economic specialist study can proceed at the same time as the other specialist studies. Only if externalities are judged significant enough to stand a chance of outweighing net benefits before their consideration does
added time need to be allocated to further analysis by the economist. This eventuality needs to be clearly stipulated and accounted for in project planning.

Environmental economics is a sub-discipline of economic devoted to the study of environmental issues such as the value of environments, pollution, the management of environmental resources, etc. Environmental economic tools can provide a framework for including the trade-offs between environmental and developmental values in one, integrative process. The added value of an application of environmental economic tools in the assessment of environmental impacts has been spelled out clearly in the literature on economics and the environment (see Dixon et al., 1994; Georgiou et al., 1997; Pearce & Turner, 1990).

There are a number of important issues that need to be kept in mind while valuing environmental impacts. First, most primary research is carried out in developed countries where primary data is generally more available. Second, there is a great deal of uncertainty attached to value estimates. Therefore, the analysis should be carried out in the context of dealing with uncertainty facing the project. Third, for projects with possible large environmental impacts, additional resources should be devoted for data collection and validation of primary research data. Finally, the evaluator will need to explicitly state omissions and subjective judgments in a transparent manner for an informed decision (Asian Development Bank, 2005).

In summary, this investigation is aimed at determining whether a project that seems beneficial at first glance, actually contains hidden environmental and other costs that need to be considered.

If linkage effects are recognized, does the project have the potential to stimulate growth, income and employment in the district/region/country? For example, a CBA may show that two projects have a similar net benefit. However, this considers only direct costs and benefits and if one analyses the linkages associated with each project a different picture may emerge. One project may import the bulk of its inputs and then export its outputs while the other makes use of a variety of locally manufactured inputs and its primary outputs and waste products can be used locally to add value to other upstream industries. These upstream industries may even be encouraged to locate near the project and thus form clusters that boost the local economy. For example, the presence of a chemicals factory may encourage fertilizer manufacturers to locate nearby – the two are linked, hence the term linkage effects.

When considering linkage effects it also important to ask whether the project will lead to real growth when it results in spending pattern changes or will it merely displace spending from other areas? For example, a new shopping mall in a large city is likely, at least for the first few years of its operation, to rely on drawing shoppers away from existing malls. Only after this initial period it may come to rely more on growth in overall spending levels associated with increased income levels and population growth. If the mall is highly successful it may even result in the closure of existing malls. Its success thus comes at a price that needs to be recognised. Other projects, notably tourism projects that attract new expenditure into the country may result in no displacement. It is also important to consider displacement effects at different scales. Displacement between local areas often does not imply displacement at a regional scale.
Does the project compliment economic development and spatial planning in the area? A project may pass the cost benefit test outlined above, but still ideally needs to be compatible with economic development plans and spatial development frameworks linked to these plans. The specialist should thus consult the relevant local and regional plans (this includes Integrated Development Plans and Spatial Development Frameworks at a minimum) as well as discuss the project’s degree of fit with planning authorities. When a project has potentially serious implications for planning, a planning specialist is typically also involved in the EIA. In some cases compatibility will be difficult to gauge, for example, if pans are incomplete or vague. This needs to be made explicit and the onus for a judgement in terms of degree of compatibility needs to be put on local and possibly regional planning authorities.

Will the project introduce macro-economic risks? A distinction needs to be made between very large projects that have the potential to change relative prices (i.e. exchange rates, interest rates or local factor and product prices) and those that don’t. If the size of a project is such that it could influence these prices then further analysis is required to identify and assess potential risks. For example, a large highly energy intensive project may increase the demand for power to such a degree that electricity prices rise affecting individuals other sectors in the economy. Similarly, large projects may soak up local funds and lead to rises in interest rates; again the impact on other sectors could be important.

Foreign direct investment is often used as a strong selling point particularly for large projects that provide an injection of capital and transfer skills and technology. However, where a project is described as 'international' there is a need to establish whether it genuinely constitutes ‘foreign direct investment’. This can be done by analysing sources of funding and foreign exchange flows. For example, a project proposed by a foreign company may seem like it constitutes desirable foreign direct investment while having a high import content, relying on local loans for funding, pay dividends to foreigners and using a predominantly foreign work force.

10.1.1 The need for and sequencing of inputs

A layered approach to assessment following the series of questions in the preceding section is advocated with elements being added as required as illustrated in Figure 3. This approach should help the specialist to conduct appropriate studies that consider the necessary impacts without going into unnecessary detail.
Figure 3: The economic impact assessment process
10.1.2 Techniques available to the specialist

A number of tools or techniques are available to the economic specialist to assist in answering the questions above. Figure 4 below shows how the assessment of questions is recommended to proceed sequentially and lists these potential techniques for each stage of assessment. This is followed by a brief description of each technique. Not all possible existing techniques and potential innovations are covered here - the focus is on the main techniques that are most often used. Ultimately it is the economist’s responsibility to chose and/or devise ways to assess impacts that are theoretically defensible.

Figure 4: Potentially applicable techniques for economic impact assessment
Cost benefit analysis

Cost benefit analysis allows for the quantification and comparison of costs and benefits of projects in present value terms. It can be applied in a purely financial sense (financial cost benefit analysis) in order to determine financial viability to the proponent or in an economic sense (economic cost benefit analysis) in which costs and benefits are compared from a societal perspective (this form of analysis is often referred to as social cost benefit analysis). Table 1 below adapted from the South African guidelines on CBA (Mullins et al., 2002) outlines the basic steps in CBA. International guidelines include those of the World Bank (Belli et al., 1997).

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Specification of purpose of the CBA and specification of project boundaries within which the analysis is to be conducted.</td>
</tr>
<tr>
<td>2</td>
<td>Identification of all impacts (i.e. costs and benefits generated by a project within the boundaries specified for analysis). It must once again be emphasised that the analyst should measure the costs and benefits relative to the nil (do nothing) alternative. Further, it is important that the analysis should not be done in terms of only a single set of parameters, but that a whole number of critical scenarios should be investigated with the aid of sensitivity analysis.</td>
</tr>
<tr>
<td>3</td>
<td>Quantification of cost and benefit streams.</td>
</tr>
<tr>
<td>4</td>
<td>Impacts, which are difficult to measure quantitatively, should nevertheless be recorded in qualitative terms and if possible ranked in order of importance. The analyst should also, as far as possible, quantify the social consequences of a project, and where such quantification is not possible they should be reported qualitatively. The following social consequences of a project should be addressed:</td>
</tr>
<tr>
<td></td>
<td>Distributional effects between income groups, population groups or geographical regions;</td>
</tr>
<tr>
<td></td>
<td>Welfare consequences;</td>
</tr>
<tr>
<td></td>
<td>Environmental impacts;</td>
</tr>
<tr>
<td></td>
<td>Political and constitutional implications;</td>
</tr>
<tr>
<td></td>
<td>Strategic consequences;</td>
</tr>
<tr>
<td></td>
<td>The creation of temporary and permanent job opportunities;</td>
</tr>
<tr>
<td></td>
<td>The achievement of economic independence; and</td>
</tr>
<tr>
<td></td>
<td>Population movements including migration.</td>
</tr>
<tr>
<td>5</td>
<td>Discounting of project cost and benefit streams to present values.</td>
</tr>
<tr>
<td>6</td>
<td>Calculation of Net Present Value (NPV) which is the sum of the discounted net benefits (benefits minus costs) and should be positive for favourable projects. Benefit:Cost Ratio (BCR) which is the ratio between benefits in costs in present value terms and Internal Rate of Return (IRR) which is the discount rate at which the streams of costs and benefits are equal.²</td>
</tr>
<tr>
<td>7</td>
<td>Sensitivity analysis on the cost and benefit streams. The analysis should be based on risk factors, which have been identified in the project setting.</td>
</tr>
<tr>
<td>8</td>
<td>Interpretation and reporting of the results of the analysis.</td>
</tr>
</tbody>
</table>

Table 1: Steps in cost benefit analysis

Source: Adapted from Mullins et al. (2002)

² Note that the IRR criterion has fallen out of favour to some extent in CBA due to it being seen as misleading in some instances as it can produce multiple answers.
Analysing opportunity costs

The consideration of opportunity costs doesn't entail a specific method or technique. It is simply an investigation that reveals the nature and value of the next best alternative foreclosed by the choice of a given alternative. Determining this value can entail a number of techniques from obtaining a value of the land in a given use from a property valuator to attempting to understand and attach a value or significance to the tourism potential of a site.

Environmental valuation

Environmental valuation techniques are used to attach monetary values to environmental impacts that can then be used within a project assessment. For example, one may need to attach a value to the goods and services provided by a wetland where a development is being proposed and compare the loss of these values with the benefits of the development. The choice of valuation technique is dependent on the context of the problem at hand. The best academic valuation technique is not necessarily the best technique to use in a practical setting. The values generated should be perceived as being credible and within the decision makers’ time and budget constraints. The valuation approach therefore depends on both technical and practical considerations (Lumby and Blignaut, 2004; Dixon et al., 1994).

Input-output tables and Social Accounting Matrices (SAMs)

Input-output tables (also sometimes called supply and use tables) provide a snap-shot of the linkages between different sectors in the economy. This is done through the use of co-efficients and values that show the proportions of total inputs that each sector gets from other sectors as well as what proportions of the total output of a sector goes to which other sectors. The tables can thus be used to trace linkages between sectors. They can also be used to generate multipliers that indicate the indirect and induced impacts of expenditure injections in different sectors. The Industrial Development Corporation (IDC) publishes input-output tables for South Africa and the theory behind input-output tables can be found in most economics textbooks.

Social Accounting Matrices are a form of extended input-output table that provide more extensive information on the household sector. This allows for the analysis of impacts on households and the distributional implications of projects. For example, a SAM could be used to assess the impact of construction expenditure on household incomes per income category.

Computable General Equilibrium models

Computable General Equilibrium (CGE) models provide a dynamic representation of interactions between key variables in the economy including demand, prices, interest rates and exchange rate. They can be used to predict the consequences of a change in equilibrium on these variables that may be brought on by large projects. For example, a CGE could be used to investigate the impacts of increased electricity prices on the prices of other goods.
10.2 DEFINING IMPACT ASSESSMENT CRITERIA

To aid decision-making, the assessment and reporting of possible impacts requires consistency in the interpretation of impact assessment criteria.

Assessing significance is largely a matter of professional judgement perhaps even more so in economics when compared to other disciplines, further highlighting the need for experienced practitioners. Conceptually the economic impact assessment process involves establishing the economic context (including economic development planning imperatives) which is then used to understand and assess impacts. Once this has been done the specialist needs to use professional judgement to ‘convert’ economic information into a professional opinion on the nature, extent, duration, intensity, probability and significance of impacts as well as attaching a confidence level to predictions. There is no formula for this conversion as it is based on the reasoned judgement of the specialist which needs to be clearly spelt out. At least the following factors should be considered in this regard:

- Any risks involved
- The degree to which impacts are reversible
- The vulnerability of the groups impacted on

The impact criteria used in EIA assessments and as outlined in Box 5 does provide some consistency in reporting between the different specialists studies. However, economic specialists studies, especially if they are reported in monetised values, does not really need such a reporting framework, as cost-benefit analyses expressed in monetary terms provide a yardstick of relative impacts. When such relative values have not been quantified or qualitatively prioritized, or when impacts cannot be monetized, these assessment criteria can come in handy.
**Box 5: Criteria used for the assessment of impacts**

The assessment of impacts should be done according to a synthesis of the following assessment criteria:

**Nature of the impact** - This is an appraisal of the type of effect the activity would have on the affected environment. This description should include what is being affected and how.

**Extent** - Here it should be indicated whether the impact will be:
- **local** extending only as far as the activity;
- will be limited to the *site and its immediate surroundings*;
- will have an impact on the *region*;
- will have an impact on a *national* scale;
- will have an impact across *international* borders.

**Duration** - Here it should be indicated whether the lifetime of the impact will be:
- **short term** (e.g. 0 – 5 years);
- **medium term** (e.g. 5 – 15 years);
- **long term** where the impact will cease after the operational life of the activity, either because of natural process or by human intervention; or
- *permanent* where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

**Intensity** – Here it should be established whether the impact is destructive or benign and should be indicated as:
- **low**, where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected;
- **medium**, where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and
- **high**, where natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease.

**Probability** – This should describe the likelihood of the impact actually occurring indicated as:
- **improbable**, where the possibility of the impact to materialize is very low either because of design or historic experience;
- **probable**, where there is a distinct possibility that the impact will occur;
- **highly probable**, where it is most likely that the impact will occur; or
- **definite**, where the impact will occur regardless of any prevention measures.

**Significance** – The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, intensity, extent and probability and be described as:
- **low**, where it will not have an influence on the decision;
- **medium**, where it should have an influence on the decision unless it is mitigated; or
- **high**, where it would influence the decision regardless of any possible mitigation.

Note that wherever possible, the specialist should refine and customize these criteria to their particular study (e.g. “high” significance is when the project could reduce local unemployment by 5% or more).

*Source: Department of Environmental Affairs and Tourism, 1998*
10.3 ESTABLISHING THRESHOLDS OF SIGNIFICANCE

Determining acceptable levels of change with regard to the generation of environmental externalities or the general degradation of the environment is primarily the responsibility of the specialists involved in bio-physical studies. For example, the air pollution specialist need to determine the maximum allowable amount of air pollution in an airshed and the vegetation specialist should determine minimum flora conservation requirements. If anything, the economist needs to make inputs as to whether these acceptable levels of change are compatible with the need for economic development.

A basic premise of economics is that ‘the free market’ is the best allocator of resources provided there are no significant externalities. This means that unless the market is distorted (e.g. by tariffs or subsidies) or has missing elements (e.g. where there are externalities such as pollution), the market mechanism should work. For this reason few economic arguments can be used to counter a profitable development.

This market based approach is difficult to contest at a local or microeconomic level. At broader levels, however, this may not be the case. A clear argument against an economically viable project would thus arise if the spatial and economic development plans for the area were being clearly violated. However, if this were the case, one would hope that the authorities wouldn’t allow the project to reach EIA stage.

More important is the case of projects so large that they can influence relative prices. Modern cost-benefit practice recognizes this possibility and if such effects seem likely, their inclusion in the analysis should be specified in the terms of reference.

10.4 DESCRIBING THE DISTRIBUTION OF IMPACTS

Positive and negative impacts or costs and benefits should be identified and assessed by the economist in the course of conducting the economic specialist study. Part of this assessment should include a consideration of who benefits and who loses from each impact. This requires the economist to identify impacts and then apply his or her mind to the question of who will be affected. The assessment of distributional impacts can form part of social cost benefit analysis. Other potentially applicable tools include Social Accounting Matrices and Supply and Use tables. The latter seem likely to become increasingly useful in identifying up to date linkage effects between sectors.

10.5 IDENTIFYING KEY UNCERTAINTIES AND RISKS

One of, if not, the most important potential sources of risk associated with projects initiated by private developers is that of financial viability. Without viability the majority of economic impacts simply won’t materialize as the project will fail. Bear in mind that while the economic specialist can comment on viability, he or she cannot be expected to delve deeply into the viability
calculations upon which developers are basing their belief in the viability of a project – i.e. with a view to auditing their projects.

Uncertainties such as whether a project will lead to the establishment of downstream industries or whether predicted visitor numbers will be attracted to a new tourism development need to be clearly spelt out. The specialist should also attach a level of confidence to predictions spelling out any constraints and their influence on findings. Sensitivity analysis is important in this regard as it can be used to show how uncertainties represented as varying assumptions can affect impact predictions. These assumptions could include a number of things such as:

- Key market responses required for financial viability
- Project construction and operational costs
- Interest and exchange rates
- The emergence of links between the project and other industries
- The distribution of impacts among winners and losers
- The carrying capacity and economic values of ecosystem goods and services

The specialist needs to spell out why changes in certain assumptions are considered reasonable and why other assumptions are not changed.

10.6 RECOMMENDING MANAGEMENT ACTIONS

Outright avoidance of a project or project component should only be recommended when a fatal flaw is identified that cannot be mitigated. As this kind of recommendation has serious implications, the analysis done by the specialist needs to be extensive and of a standard that can be defended in a court of law.

Ideally mitigation should be required up to the point where the project is at least positive on balance from an economic perspective (i.e. benefits exceed costs). Further mitigation beyond this point may lead to additional environmental benefits, but will come at a higher economic cost. Although it may be tempting to recommend mitigation beyond these levels, it is not justified on economic grounds.

Negative economic impacts or externalities often stem from bio-physical impacts such as pollution. The mitigation measures recommended by, say, the pollution specialist can then be referred to by the economist, but need not be repeated. Mitigation for other negative impacts not linked to environmental impacts should be identified by the economic specialist bearing in mind possible cost implications. Mitigation for economic impacts often overlaps that for social impacts. Co-operation with the social specialist is recommended in this regard. The project proponent should include a comment in the specialist assessment on their ability to implement the management actions recommended by the economic assessment.

Theoretically compensation is justified in the case of genuine externalities – i.e. where costs are imposed by one party onto another. However, although the polluter pays principle is recognised,
current South African law does not necessarily recognize the right to compensation in these cases. In the case of outright expropriation there are clear legal guidelines that govern the process and should ensure fairness.

Opportunities for economic benefit enhancement often arise particularly with regard to the use of labour. Hiring local people as far as possible and / or providing training for them can enhance benefits and enhance community relations. Care must, however, be taken to implement hiring programmes that are compatible with local community structures. Community representatives should be involved to ensure that only genuine local people are given preference. This is not only critical to ensuring that benefits materialize but also to discouraging the in-migration of job seekers. Care must also be taken to not unrealistically raise the expectations of potential beneficiaries. The proponent may be tempted to make unrealistic promises in the hope of gaining community support for a project. The EIA practitioner has an important role to play in advising the proponent against this practice.

10.7 IDENTIFYING THE BEST PRACTICABLE ENVIRONMENTAL OPTION

Factors that need to be considered by the economic specialist in selecting the Best Practicable Environmental Option (BPEO) from a range of agreed alternatives include the following:

- Performance with regard to a cost benefit analysis;
- Distribution of costs and benefits (impacts);
- Linkage effects;
- Degree of fit with economic development planning in the area (i.e. desired future state);
- Macro-economic risks

Each specialist assessment will identify the BPEO from a range of given options, or even add to the set of options. It is the responsibility of the EIA practitioner to evaluate the BPEO recommendations within the various specialist assessments and provide a recommendation for the overall BPEO, which takes into account the outcomes of the various specialist assessments.

10.8 COMMUNICATING THE FINDINGS OF THE IMPACT ASSESSMENT

Specialist assessment reports should be concise and, as far as possible, avoid the use of technical terminology. Where this is unavoidable, brief explanations should be provided in order to ensure that the reader is able to understand the approach to, and findings of, the specialist assessment.

Appendix C provides a model table of contents for a specialist assessment.

In order to answer the "so what" question, specialist assessments must include a:

- Summary impact assessment table using the defined impact assessment and significance rating criteria;
- Clear indication of whether impacts are irreversible or result in a welfare loss to society.
- Statement of impact significance for each issue specifying whether level of acceptable change has been exceeded and whether the impact presents a potential fatal flaw;
- Identification of beneficiaries and losers from the proposed development.
- Specification of key risks and uncertainties that may influence the impact assessment findings.
- Degree of confidence in the impact assessment prediction.
- Summary of key management actions that fundamentally affect impact significance.
- Identification of the best practicable environmental option, providing reasons.
- Identification of viable development alternatives not previously considered.

11. MONITORING PROGRAMMES

Monitoring programmes linked to economic specialist studies are scarce in South African EIA practice. Perhaps this is because monitoring has correctly tended to focus on bio-physical and social impacts. Those that have been initiated by economic specialist studies have tended to focus on monitoring labour use on projects to ensure targets for labour intensity and the use of locals are met.

For economic specialist studies there is clear potential for overlap between the establishment of the economic context and baseline monitoring. Often the economic context before a project is initiated constitutes the baseline against which impacts need to be monitored.

During the construction and operational phase labour use issues are often prominent. Maintaining the agreed on composition of the labour force on a project needs to be monitored in conjunction with the proponent. The environmental site officer is often in the best position to fulfill this role. Monitoring may also be required to be sure that any agreements for the procurement of local materials and plant are adhered to.
PART E: REVIEW OF SPECIALIST INPUT

12. EVALUATION OF SPECIALIST INPUT

The role of the independent peer review process is outlined in the guideline for the review of specialist input into the EIA process. This guideline has outlined what should be expected of an economic specialist study. Specific aspects that should be present in high quality assessment include an explicit consideration of opportunity costs, the answering of the primary questions needed for economic studies outlined in section 10.1 and a clear indication that theoretically rigorous methods and techniques were applied.

13. REFERENCES


Western Cape Provincial Treasury. 2003. Western Cape Socio-economic Profile. Western Cape Provincial Treasury, Cape Town.


14. USEFUL RESOURCES

In 2002 the Water Research Commission released a guideline document for conducting Cost Benefit Analysis in South Africa with special reference to water resource development (Mullins et al., 2002). Although this document uses water resource developments as primary case studies, the guidelines are applicable to CBAs of all types of development and represent current best practice in South Africa.
## APPENDIX A: DEFINITIONS AND ACRONYMS

### DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternatives</td>
<td>A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.</td>
</tr>
<tr>
<td>Best practicable environmental option</td>
<td>This is the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.</td>
</tr>
<tr>
<td>Cost benefit analysis</td>
<td>Economic technique in which costs and benefits are identified, quantified where possible and weighed up against each other</td>
</tr>
<tr>
<td>Environmental economics</td>
<td>Sub-discipline of economics focusing on the analysis of environmental issues. Also known as resource economics or referred to as ‘environmental and resource economics’</td>
</tr>
<tr>
<td>Environmental externality</td>
<td>Environmental impact that causes a change in the welfare of others that is not compensated for (or charged for in the case of positive externalities)</td>
</tr>
<tr>
<td>Environmental impact assessment</td>
<td>An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.</td>
</tr>
<tr>
<td>Environmental valuation</td>
<td>Quantifying the monetary value of environmental impacts using economic techniques</td>
</tr>
<tr>
<td>Impact</td>
<td>A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space</td>
</tr>
<tr>
<td>Induced effects</td>
<td>See linkage effects</td>
</tr>
<tr>
<td>Issue</td>
<td>Issues are concerns related to the proposed development, generally be phrased as questions, taking the form “what will the impact of some activity be on some element of the biophysical, social or economic environment?”</td>
</tr>
<tr>
<td>Key issue</td>
<td>An issue raised during the scoping process that has not received an adequate response and which requires further investigation before it can be resolved.</td>
</tr>
<tr>
<td>Linkage effects</td>
<td>Economic effects that occur as a result of links between sectors in the economy. For example, linkage effects may result in a new business opening up in an area to use the outputs of a proposed factory. Also know as induced or knock-on effects.</td>
</tr>
<tr>
<td>Macro-economics</td>
<td>Focused on economic issues at a national and sometimes regional scale.</td>
</tr>
</tbody>
</table>

---

APPENDIX A: DEFINITIONS AND ACRONYMS
### Micro-economics
Focused on economic issues at smaller (non-national) scales such as those facing individuals and firms.

### Multiplier effects
The total effects of an initial injection of spending once it has circulated through the economy.

### Opportunity cost
The costs associated with foregoing the next best alternative.

### Scenarios
A description of plausible future environmental states that could influence the nature, extent, duration, magnitude/intensity, probability and significance of the impact occurring.

### Stakeholders
A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

### Thresholds of significance
The level or limit at which point an impact changes from low to medium significance, or medium to high significance.

### ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT</td>
<td>Best available technology</td>
</tr>
<tr>
<td>BPEO</td>
<td>Best Practicable Environmental Option</td>
</tr>
<tr>
<td>DEA&amp;DP</td>
<td>Department of Environmental Affairs and Development Planning</td>
</tr>
<tr>
<td>CBA</td>
<td>Cost benefit analysis</td>
</tr>
<tr>
<td>DEAT</td>
<td>Department of Environmental Affairs and Tourism</td>
</tr>
<tr>
<td>DWAF</td>
<td>Department of Water Affairs and Forestry</td>
</tr>
<tr>
<td>EAP</td>
<td>Environmental Assessment Practitioner</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
</tr>
</tbody>
</table>
APPENDIX B: MODEL TERMS OF REFERENCE FOR SPECIALIST INPUT

Terms of reference for specialist input should include the following elements:

1) Project description
2) Overview of EIA process and timeframes
3) Specific issues and information requirements to be addressed by the specialist
4) Key sources of information
5) Approach to be used
6) Requirements to attend meetings and workshops
7) Requirements to liaise and exchange information with other specialists
8) Protocol for additional stakeholder engagement
9) Report template providing structure of contents, formatting styles and standard terminology (including impact assessment criteria if applicable)
10) Clarification of review and integration process
11) Requirements for specialist sign off on the specialist report and inputs to integrated reports
12) Summary of tasks, deliverables and due dates
13) Budget and payment schedule, including penalty clause
14) Confidentiality agreement
15) Communications protocols during the project (e.g. can the specialist discuss the project with journalists?)