GUIDELINE FOR INVOLVING ECONOMISTS IN EIA PROCESSES

PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
AND DEVELOPMENT PLANNING

Edition 1
June 2005

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This guideline should be cited as:

Van Zyl, H.W., de Wit, M.P. & Leiman, A. 2005. *Guideline for involving economists in EIA processes: Edition 1.* CSIR Report No ENV-S-C 2005 053 G. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

ACKNOWLEDGEMENTS

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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. In particular, thanks are due to Sam Ralston (Wildlife and Environment Society of South Africa) and Paul Claassen (Environomics) for their comments.

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PREFACE

The purpose of Environmental Impact Assessment (EIA) processes are to provide decision-makers (be they government authorities, the project proponent or financing institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines 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. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA processes 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. The terms “specialist involvement” and “input” have been used in preference to “specialist assessment” and “studies” to indicate that the scope of specialists’ contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

	ISSUES
TIMING	▪ 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?
SCOPE	▪ Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? ▪ What are appropriate approaches that specialists can employ? ▪ What qualifications, skills and experience are required?
QUALITY	▪ What triggers the review of specialist studies by different roleplayers? ▪ 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?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- 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 in EIA processes* and the *Guideline for the review of specialist input in EIA processes* 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 focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

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 they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) 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). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced 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 process best practice without being tied to specific legislated national or provincial EIA process terms and 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.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists 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 to improve the quality of specialist input.

Furthermore, 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, modeling), 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 process is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

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 potentially requiring specialist input;
- **Part C**: Planning and coordination 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

This guideline deals with the involvement of economists in Environmental Impact Assessment (EIA) processes. It provides clear guidance as to when economic inputs should be provided; which aspects must be addressed by the economic specialist; and specific criteria against which economic inputs can be measured to ensure that the assessment meets a set of minimum requirements, is reasonable and objective and is theoretically sound.

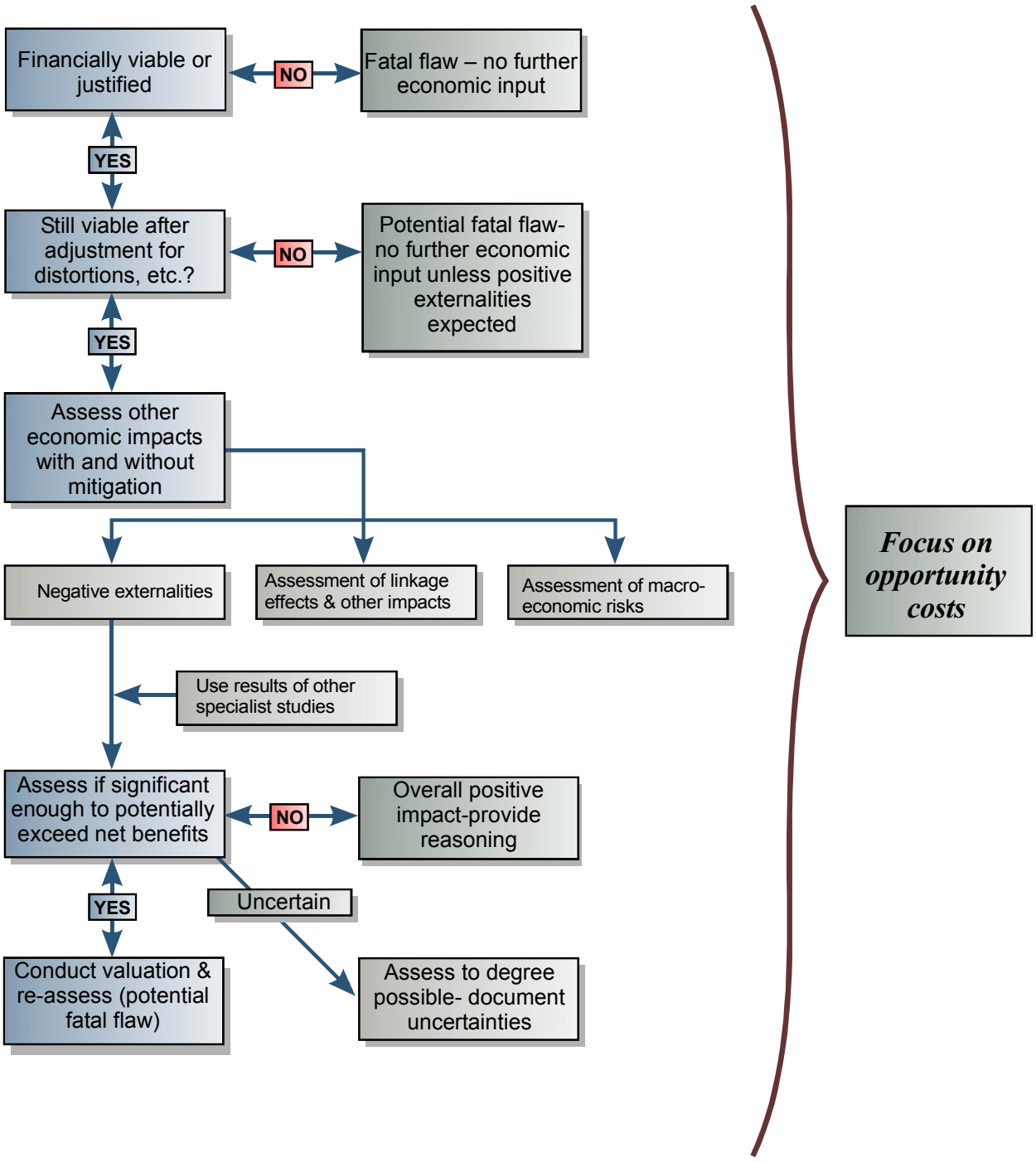
The basic function of the economic specialist is to determine whether a project or policy will enhance net societal welfare. At a broad level, investigating impacts on overall welfare requires considering the efficiency, equity and sustainability of the project. Keeping these principles in mind, the 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 considered and 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 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. Whether the economist 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 economic input that follows the principles of cost benefit analysis is thus advocated with elements being added as required, as illustrated in the figure 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; it is the economist's responsibility to choose and/or devise ways to assess impacts that are theoretically defensible.



The economic impact assessment process

Impacts need to be assessed with and without management actions that aim to avoid or minimize negative impacts and enhance benefits. Ideally management actions should be required up to the point where the project is at least positive on balance (i.e. benefits exceed costs). Further management beyond this point may lead to additional environmental benefits, but will come at a higher economic cost.

Economic specialist inputs 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 inputs. 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.

CONTENTS

Appendices

List of figures

List of tables

List of boxes

ECONOMIC SPECIALIST GUIDELINE

PART A : BACKGROUND

This part of the guideline introduces the field of economics, gives principles and concepts underpinning specialist input on economic issues, impact assessment and management, contextualizes specialist input and looks at the role and timing of specialist input in the EIA process.

1. INTRODUCTION

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

Some EIA processes proceed with TOR that call for economic specialist studies focusing on either micro-economic or macro-economic issues, while others require consideration of both micro and macro issues. In addition, socio-economic impact studies have become more commonplace requiring the assessment of social and economic impacts in one combined report. This profusion of approaches and vague TORs has lead to unnecessary confusion and has lessened the efficacy of economic inputs in EIA processes.

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 inputs (i.e. what are the questions that regularly need to be addressed by economists in EIA processes?). Some inputs 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 macro-economic 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 (CBA)’, (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 arise if the TORs 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) embarked on the process of developing a guideline for the involvement of economic specialists in EIA processes.

2. PRINCIPLES AND CONCEPTS UNDERPINNING ECONOMISTS' INVOLVEMENT IN EIA PROCESSES

The basic function of economic specialist input in the EIA process is to assist in the determination of whether a project 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 (for example, if farming is the next best alternative for a piece of land, then the foregone benefit associated with it will be the opportunity cost of any other land use). 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 i.e. the "no-go alternative".

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. Taking the example of a new industrial plant, efficiency issues could include whether desired production levels can be reached using fewer resources, equity issues could include the distribution of any income from the plant and sustainability issues could include whether the plant will be a financial success in the long term without being to the disadvantage of those living nearby.

Key economic terms are defined in Appendix A.

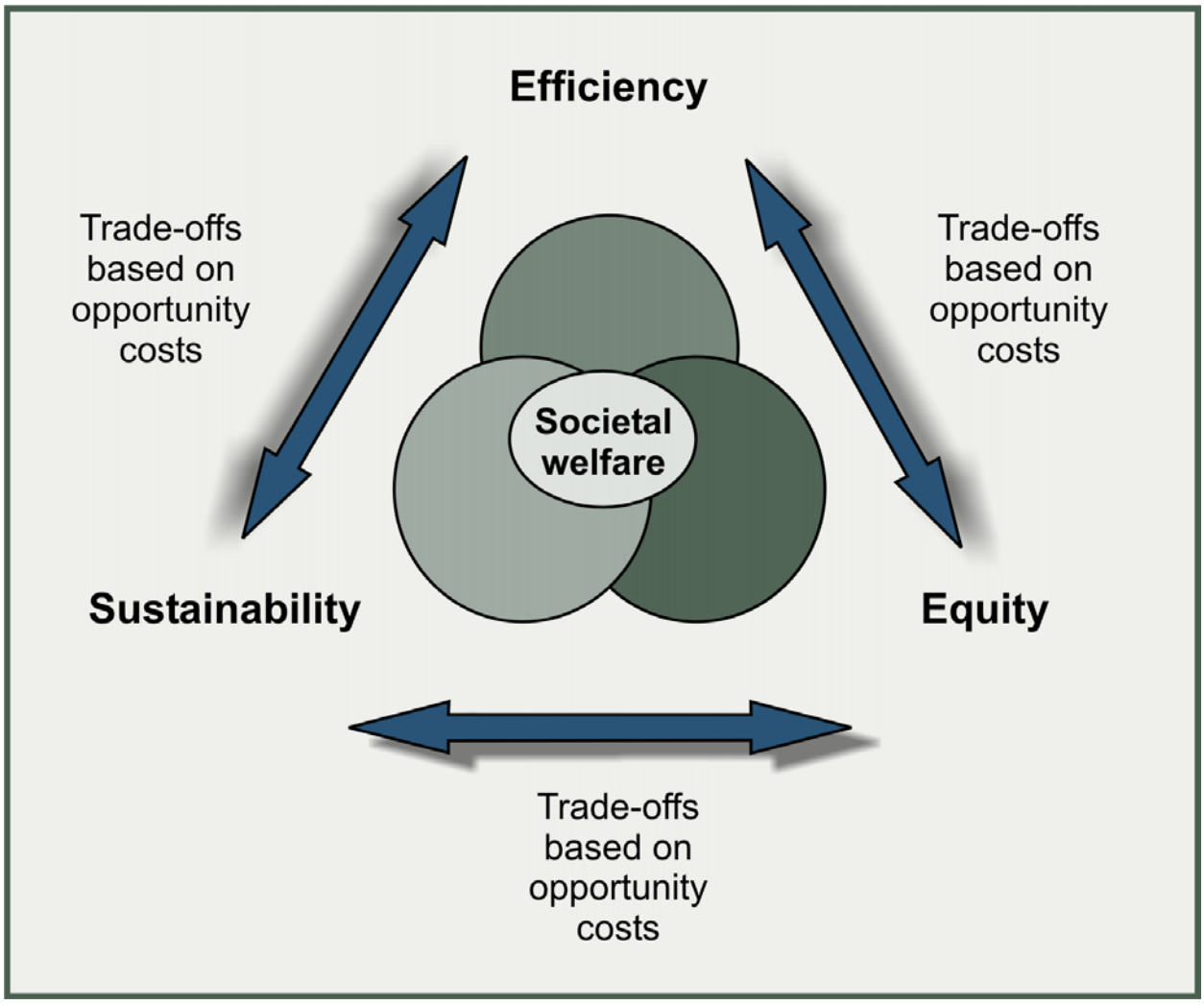


Figure 1: Economic principles and concepts in EIA processes

Following the definition of key economic principles, the following generic principles apply to the involvement of specialists in EIA processes:

- Eliminate unnecessary specialist involvement through proactive project planning and design to avoid or sufficiently reduce negative impacts that may otherwise require specialist assessment;
- Maximise use of existing relevant information prior to involving a specialist;
- Where appropriate and necessary, involve specialists early in the EIA process to increase efficiency and effectiveness of their involvement.
- Maintain continuity of specialist involvement throughout the process (specialist involvement should add value to project planning and design);
- Support flexible, focused and appropriate involvement of specialists to provide adequate, relevant information to make informed decisions (i.e. the correct level of information should be supplied at the right time in the EIA process);

- Allow for greater involvement of specialists in the identification of key issues, over and above those identified through stakeholder engagement processes;
- Allow for efficient and effective interaction between specialists and the EIA practitioner, the project proponent, the authorities, other specialists on the EIA team and other interested and affected parties (I&APs) to improve the quality of the EIA process and outcomes and ensure that findings are informed by local and indigenous knowledge and experience.

Common EIA terms and concepts used throughout this series of guidelines are summarised in Box 1.

Box 1: Common EIA terms and concepts

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

- ***Environmental impact assessment:*** A process that is used to identify, predict and assess the potential positive and negative impacts of a proposed project (including reasonable alternatives) 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 financial institutions. The process includes some or all of the following components: pre-application planning, screening, scoping, impact assessment (including the identification of management actions and monitoring requirements), integration and decision-making. Suitably qualified and experienced specialists may be required to provide input at various stages of the EIA process.

- ***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 statutory approval. 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 financial 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 impact assessment. The main purpose is to focus the impact 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 that may require specialist input. Legal requirements of existing and future

legislation may also trigger the need for specialist involvement but are not discussed in this guideline.

- ***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 the impact of atmospheric emissions on the health of surrounding communities?).

- ***Impact:*** 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 (e.g. an increased risk of respiratory disease amongst people living within a 10km radius from the industry, for the duration of the life of the project, due to sulphur dioxide emissions from the industry).

- ***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).

- ***Risk situation:*** A description of the environmental or operating circumstances that could influence the probability of a significant impact occurring.

- ***Scenarios:*** A description of plausible future environmental or operating conditions that could influence the nature, extent, duration, magnitude/intensity, probability and significance of the impact occurring (e.g. concentration of sulphur dioxide emissions during normal operations vs during upset conditions; dispersion of atmospheric pollutants during normal wind conditions vs during presence of an inversion layer).

- ***Alternatives:*** A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The "no-go" alternative constitutes the 'without project' option and provide a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

- ***Best practicable environmental option:*** This is the alternative/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.

- ***Impact significance:*** A term used to evaluate how severe an impact would be, taking into account objective or scientific data as well as human values. A specific significance rating should not be confused with the acceptability of the impact (i.e. an impact of low significance is not automatically "acceptable").

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

- ***Management actions:*** Actions – including planning and design changes - that enhance benefits associated with a proposed development, or that avoid, mitigate, restore, rehabilitate or compensate for the negative impacts.

- ***Monitoring programmes:*** Programmes established to observe, take samples or measure specific variables in order to track changes, measure performance of compliance, and/or detect problems.

- ***Review:*** The process of determining whether specialist input meets minimum requirements, is reasonable, objective and professionally sound.

3. CONTEXTUALISING THE SPECIALIST INPUT

This section provides a brief overview of the legal, policy and planning context for involving an economic specialist, and gives the specific Western Cape context within which that specialist would be working. Readers need to be aware that legislation, policies and plans are reviewed periodically. The guidelines, therefore, do not replace the need to consult the currently applicable legislation, policies and plans.

3.1 LEGAL, POLICY AND PLANNING CONTEXT FOR INVOLVING AN ECONOMIST

3.1.1 National context

Current South African environmental legislation governing the EIA process, which includes consideration of economic impacts associated with proposed developments, is the National Environmental Management Act (NEMA) (Act No. 107 of 1998) and the EIA regulations in terms of the Environment Conservation Act (Act No. 73 of 1989). The regulations governing the EIA process are currently being revised and will be replaced by regulations promulgated in terms of the National Environmental Management Act (Act No. 107 of 1989).

At a national level there is no single unified economic development or planning policy relevant to economic inputs to EIA processes. 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 government departments within 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 Department of 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 EIA processes.

Each department has its own approach and philosophy towards sustainable development, which is not surprising given the broad objectives of sustainable development. It is also not surprising that the policies and approaches of the different government departments 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 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 providing specialist input to an EIA process, however, the economist's role is to highlight areas of conflict so that these can be considered during the decision-making process.

3.1.2 Provincial context

The Department of Economic Development and Tourism is the primary provincial government body in the Western Cape 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 (DEA&DP) 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] The Western Cape provincial government supports the bioregional planning concept at a provincial and local level and the Bioregional Planning Framework states that, "To promote sustainable development in the Western Cape, it will be necessary to institute planning and management systems that would facilitate a balanced integration of conservation and development interests in land-use and settlement planning. International experience has shown that biodiversity conservation is a prerequisite for sustainable development, and that for biodiversity conservation to succeed, the maintenance of environmental integrity (as defined by ecological, economic and social criteria) must be one of the primary determinants of land-use planning." (Dennis Moss Partnership, 2000). Bioregional planning, is thus not a planning process on its own, but an approach that supplements the statutory spatial planning process by providing a spatial and theoretical framework for the integration of social, environmental and economic criteria in local planning initiatives. It involves the identification of priority areas for conservation and their placement within a supportive planning framework of buffer and transition areas (i.e. creating integrated landscapes).

3.1.3 Local context

Local and regional municipalities are the primary government body tasked with local economic development issues. In terms of the Municipal Systems Act, (Act No. 32 of 2000) it is

[1] The Western Cape provincial government information dissemination website (www.capegateway.gov.za) provides information on economic development policies.

compulsory for all municipalities to go through an Integrated Development Planning process to prepare a five-year strategic development plan for the area under their control. In addition, the White Paper on Spatial Planning and Land Use Management (Department of Agriculture and Land Affairs, 2001) states that, "Apart from the plan-making role of government, municipalities will also be charged with the responsibility of taking decisions on land development applications made to them. Local government is the sphere of government at the coalface of land development. It is therefore important that this sphere of government be charged with the responsibility for making decisions regarding land development." The duty of municipal officials to prevent pollution and ecological degradation, to promote conservation and secure ecologically sustainable development and use of natural resources, originates from the Constitution and NEMA and have again been confirmed in the Local Government: Municipal Systems Act (Act No. 32 of 2000).

3.2 ENVIRONMENTAL CONTEXT FOR SPECIALIST INPUT

Economic specialists need to take into account the specific nature of the biophysical, social and economic environment within which they are providing input. Box 2 provides a brief description of the environmental context for economic inputs to EIA processes in the Western Cape.

Box 2: A brief description of the environmental context for economic inputs to EIA processes 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 Western Cape Provincial Treasury (2003)

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

The role and timing of specialist input within the broader EIA process involves a number of aspects that need to be considered, i.e.:

- Whether, when and why specialist input is required – see Sections 5 and 6 and the *Guideline for determining the scope of specialist involvement in EIA processes;*
- What the scope of specialist input should be - see Section 8, 10 and 11;
- What level/intensity of specialist input is required – see Section 8.

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 process more effective as well as expeditious. Table 1 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 potential fatal flaws and steer the project towards greater economic acceptability thus minimising the need for reactive changes later on. Economic input during pre-application planning 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.

During the **screening stage**, specialist input from an economist may be required to inform the decision whether or not a development proposal requires environmental assessment, and if so, what level of assessment is appropriate.

At the **scoping stage**, the economist can assist in the identification of key economic issues and the determination of those that require further impact assessment. This should be done in consultation with the EIA practitioner whose responsibility includes sourcing input on issues from interested and affected parties (I&APs), authorities, the proponent and other sources. Economists should use their training and experience with similar projects to identify any other issues that may not have been identified.

The need to guide the process concerning which issues do not require further assessment beyond the scoping phase, 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 not be assessed further if they are confident that it will have little bearing on the project decision or management path. For issues requiring further assessment, the economist should discuss and agree on the terms of reference for further economic input with the EIA practitioner.

Once scoping is complete, the economic specialist may be needed to conduct the **impact assessment** of key issues that were unable to be addressed during the scoping phase. This includes the assessment of the nature, extent, duration, magnitude, probability and significance of impacts, as well as providing recommendations for management actions that aim to avoid or minimize negative impacts and enhance project benefits.

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 process.

Table 1: Economic specialist involvement in the EIA process

Stage of EIA	Role of economic specialist	Level of detail required
Pre-application planning	Advise on potential negative impacts, opportunity costs and their implications	Low
Scoping	Identify potential issues, respond to those that can be addressed without further assessment and advise on those needing further investigation	Medium
Impact assessment	Impacts defined and assessed in an economic specialist study	High
Monitoring and management	Post-project approval economic performance assessed	Medium

The involvement of specialists should not be seen as an obstacle in the approval process. Specialist input, especially at the early stages of project planning, can play an important role in helping to identify potential "fatal flaws" and formulate practical design alternatives that enhance project benefits, as well as minimise negative impacts, and possibly even project costs.

Depending on the nature of the project, the stage of project planning and the EIA process, the environmental context and the amount of available information, specialist involvement will vary in intensity (i.e. level of detail) and may include any or all of the following approaches:

- Provision of a specialist opinion or comment;
- Archival research and literature review;
- Detailed baseline survey (including site visit/s);
- Consultation and interviews;
- Mapping and simulation modelling;
- Assessment of impacts and their significance.

A specialist's role in the EIA process could be to assist with any or all of the following:

- Describing the affected environment
- Describing the legal, policy and planning context
- Identifying and responding to issues

- Identifying alternatives
- Identifying opportunities and constraints
- Developing specialist terms of reference (TOR)
- Predicting and assessing impacts
- Recommending management actions and monitoring programmes
- Undertaking an independent peer review of specialist input

Terms of reference for specialist involvement should, therefore, be appropriate to the purpose and intensity/scale of involvement and should be discussed and agreed between the EIA practitioner and the specialist (and the authority where relevant).

The *Guideline for determining the scope of specialist involvement in EIA processes* provides more detailed guidance on the role and timing of specialist input and provides a generic approach that can be used to determine the need for specialist involvement. Clarification of responsibilities amongst the different roleplayers, as well as prerequisites for specialists to provide effective, efficient and quality input, is included.

PART B : TRIGGERS AND KEY ISSUES POTENTIALLY REQUIRING SPECIALIST INPUT

This part of the guideline looks at the triggers and key issues potentially requiring economist's input to the EIA process.

5. TRIGGERS FOR SPECIALIST INPUT

A 'trigger' means a characteristic of either the receiving environment or the proposed project which indicates that economics is likely to be a 'key issue' and may require the involvement of an appropriately qualified and experienced specialist. Legal requirements of existing and future legislation may also trigger the need for specialist involvement but are not discussed in this guideline.

The scoping phase should identify whether there are key economic issues that trigger the involvement of an economic specialist. Whether these 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 relevant information to decision-makers and I&APs where necessary, while at the same time avoiding unnecessary study. Input from an economic specialist is required if there is a chance that economic impacts are likely to influence the decision whether or not a project is desirable on balance and/or influence the development path selected for the project. Determining this can be challenging as most projects from the smallest to the largest will lead to some form of economic impact. Larger projects tend to lead to greater economic impacts due to their potential for 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 process is also a function of the nature and timing of the project development planning process. The following factors may trigger the need for involving an economic specialist:

- If no previous economic feasibility studies have been conducted, specialist economic input is certainly needed. If the opportunity costs of not developing have not been highlighted earlier, economic specialists 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 EIA processes 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 can be involved to provide 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.

6. KEY ISSUES REQUIRING 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 process and focus the assessment on key issues that will affect decision-making. Where stakeholders have no interest in or may be poorly informed about economic issues, such issues may be overlooked. The involvement of an economist in scoping is therefore important, especially where there are triggers indicating that economic impacts may be significant. 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 to clearly indicate 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 and exchange rates, become important here.

The key negative and positive 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, economic, perspective;
- Environmental externalities that are not accounted for in economic 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; and
- 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. For this reason a sequential approach to assessing economic issues is advocated for all types of developments in all contexts. This approach is discussed further in Section 10.1. Figure 3 identifies the important sequence of decisions that need to be made regarding which issues need to be assessed further (i.e. the figure gives guidance on "when to do what").

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

Once the need for economic specialist input has been determined, the scope of specialist input needs to be clarified through discussions between the EIA practitioner, the specialist, the proponent and the decision-making authority. This part of the guideline covers the choice of an appropriate specialist, and the negotiation process leading to sound terms of reference (TOR) for that specialist. Appendix B gives generic TOR for specialist input.

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 related to development decision-making. While the requirements for research assistants need not be stringent beyond requiring a graduate degree in economics, 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/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 all 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 EIA processes, 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 to provide specialist input 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.

In addition to the above, the specialist should:

- Be competent at interpreting and evaluating information and answering the "so what" and “to whom” questions relevant to EIA decision-making, rather than simply providing descriptive information;
- Have sufficient practical experience working in the specific affected region (or similar environments), and preferably local area, to make him/her respected by peers and stakeholders;
- Be able to think beyond his/her immediate discipline, able to trace impact pathways and

identify indirect or cumulative impacts, and think of biodiversity/human wellbeing/economic interfaces;

- Have good knowledge relating to assessment techniques and to relevant legislation, policies and guidelines; and
- Be independent i.e. the specialist should not benefit financially from the outcome of the project decision-making.

8. DETERMINING THE SCOPE OF SPECIALIST INPUTS

The scope of the specialist input needs to be clarified through discussion between the EIA practitioner, the specialist, the proponent and, possibly, the relevant authorities. For this it is important that the participants in this discussion have a common understanding of the commonly used (and confused) EIA process terms (Section 2). Sections 8.1 – 8.9 provide a brief overview of elements that should be discussed and agreed upon at the outset of the specialist's involvement in the EIA process and in drafting TOR[2]. Supplementary generic guidance is provided in the *Guideline for determining the scope of specialist involvement in EIA processes.*

In complex and/or controversial projects, the draft TOR for specialists should preferably be reviewed by key stakeholders before they are finalized. Alternatively, the TOR for specialists should be evaluated by an independent reviewer.

8.1 IDENTIFYING AND RESPONDING TO ISSUES

The economic specialist could be asked *either* to identify issues, *and/or* to respond to, *and/or* to investigate issues raised through the scoping process. The Scoping Report should be consulted by the specialist in order to ensure that any economic issues raised are considered appropriately. The economist should therefore determine:

- Whether the issues raised through the scoping process are valid in the context of the proposed project, and need to be addressed further. The specialist is not necessarily required to assess each issue raised during scoping; a response or a comment on why the issue is not relevant or is not assessed further may suffice in some cases. The specialist must give sound reasons to support his/her conclusions.
- Whether there is enough information to predict reliably the likely significance of key issues and associated impacts. If not, additional information should be gathered.
- Whether or not additional key issues need to be considered (i.e. issues that were not raised by stakeholders through the scoping process). The specialist must provide clear reasons for including any additional issues in the EIA process.
- Where there is sufficient reliable information, the economic specialist must determine:
    (a) Whether or not it can be reliably concluded that impacts could be avoided either by amending the project proposal, pursuing alternatives, and/or by appropriate management actions. *In this instance the specialist should provide sound*

[2] Recommended reading: DEAT, 2002

motivation and justification for his/her conclusions. There would then not be a need to assess these issues further in the impact assessment phase and the further involvement of the economic specialist/s would be unnecessary.

(b) Whether or not the issue is potentially significant, and/or the issue and associated impacts cannot be avoided. *In this instance the specialist should indicate the field of economic expertise need to address the issue and help draw up sound terms of reference for specialist inputs during the impact assessment phase.*

If appointed to provide specialist input during the impact assessment phase, the specialist should respond to and/or address all those economic issues raised during scoping which were deemed to lead to potentially significant impacts, were unavoidable and/or about which there was insufficient information to reach conclusions at the scoping stage about their potential impact significance.

The specialist may be requested to evaluate the adequacy of stakeholder scoping from an economics perspective, particularly where local communities in rural or remote areas who could be dependent on ecosystem goods and services have not been given an adequate opportunity to raise issues concerning the potential impact of the proposed project on their livelihoods. Such circumstances may warrant additional scoping of economic issues.

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 provincial or national scale while those that are smaller will generally lead to local and possibly provincial 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.

All projects regardless of their size generally lead to local impacts. Impacts at this level are often of greatest importance as local people and resources 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.

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 wastewater, boundaries for downstream effects need to be agreed upon in conjunction with the EIA practitioner and relevant authorities. For example, should only the area immediately affected be included, or should downstream impacts (often beyond national boundaries) on irrigation, fishing, and drinking water be accounted for? (Asian Development Bank, 2005).

The parts of the economic specialist input 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 water quality specialist study are required first. Agreement is needed between the EIA practitioner and the specialist(s) on timing before the economist commences with work.

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 CLARIFYING APPROPRIATE DEVELOPMENT ALTERNATIVES

In the pre-application planning phase, screening and scoping phase, the specialist should ideally be involved in assisting the project proponent in identifying the range of viable alternatives that, from an economic perspective, would avoid or prevent significant negative impacts and enhance benefits.

Alternatives considered in the EIA process can include *location* and/or *routing* alternatives, *layout* alternatives, *process* and/or *design* alternatives, *scheduling* alternatives, *input* or *financing* alternatives[3]. Any development proposal may include a range of possible alternatives from some or all of these various categories of alternatives. The *"no-go*" alternative in EIA processes provides a benchmark against which to evaluate potential impacts of the proposed project alternatives.

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 recommendation would be difficult to make.

An understanding of the context within which the project is proposed will allow the specialist to contribute to the process of deciding on reasonable alternatives that are compatible with this context. Typically the scope for the consideration of real alternatives at an EIA process 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.

[3] Recommended reading: DEAT, 2004a.

8.4 ESTABLISHING ENVIRONMENTAL AND OPERATING SCENARIOS

Scenarios are plausible future environmental or project operating conditions that could influence the outcomes of the impact prediction and assessment. Informed decision-making needs to be based on a consideration of possible impacts under a range of scenarios, including the worst-case scenario.

The definition of possible environmental and operating scenarios that could influence the nature, extent, duration, intensity, probability and significance of impacts needs to guided by the economic specialist and 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.

Environmental scenarios that may be relevant to the economist include:

- Different development trends or strategies that would lead to different "future states" for the affected area;
- Different interest, inflation and exchange rates;
- Different property value growth rates;
- Different levels of reliance on ecosystem goods and/or services in the affected areas.

Operating scenarios that may be relevant to the economist include:

- Different types and sources of materials and skills required by the proposed project;
- Different costs of raw materials;
- Different values for the goods or services to be produced by the proposed project;
- Different costs for accessing/utilising the proposed development.

8.5 ADDRESSING DIRECT, INDIRECT AND CUMULATIVE IMPACTS

The specialist must consider potentially significant direct, indirect and cumulative impacts of a proposed activity[4]. This requires the following:

- Conceptualisation of possible cause-effect pathways resulting from the proposed development;
- An understanding of current and future plans, projects and activities in the same area;
- An awareness of other threats or trends that could affect the system, communities or species located within the area in which the development is proposed;
- An understanding of the likely resilience and status of affected systems, communities or species;
- An understanding of broader strategic goals or targets for the area that would be affected by the proposed project.

[4] Recommended reading: DEAT, 2004b

The level of detail to which these should be considered will be influenced by the nature of the proposed project and issues raised through the scoping process.

Where potentially significant cumulative effects are likely and cannot be addressed in the EIA, the specialist should alert the EIA practitioner and decision-maker/s to these effects and make explicit recommendations as to ways of addressing them (e.g. through a strategic environmental assessment or systems-based approach).

The following box provides a useful definition of the different interpretations and components of direct, indirect and 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 temporary 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:

- 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).
- 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).
- Time crowding: frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources).
- 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).
- Space crowding: high spatial density of impacts on an ecosystem (e.g. rapid informal settlement).

Source: Adapted from Cooper, 2004.

Misinterpretation of cumulative effects on environmental values has the potential to make projects (particularly those that follow from initial greenfield development 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 subsequently 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 potential concern for the area as part of the Integrated Development Planning process and/or the initial environmental assessment process (SEA or EIA). This allows for clear 'rules' to be set up front before any development takes place through a process that should ensure that they are accepted and applied by the authorities responsible. 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.

8.6 SELECTING THE APPROPRIATE APPROACH

The potential involvement of the specialist at the pre-application planning, screening and scoping stages of the EIA process is generally less formalized than during the impact assessment stage. For example, during scoping the EIA practitioner may have already made a preliminary identification of economic issues and may only need brief input from an economic specialist to check whether there may be other issues not yet identified.

Where specialist input is required during the impact assessment stage, 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) Predict potential impacts using professional judgement as well as inputs from other specialists and stakeholders from scoping.
(3) Assess impacts relative to the economic context both with and without management actions and complete the impact rating tables.

Step 1, outlining the context is discussed in Sections 3 and 9.2. Predicting potential 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 EIA practitioner and specialist on an appropriate approach that addresses the key issues of the economic efficiency, equity and sustainability of the proposed project (see Section 2 and 6). Section 10.1 outlines recommended approaches to assessment as well as the tools that can be used.

8.7 CLARIFYING THE TIMING, SEQUENCING AND INTEGRATION OF SPECIALIST INPUTS

The key factor that will determine the timing of the economic specialist input in relation to the other specialist inputs 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 enough to stand a chance of outweighing net benefits does additional time need to be allocated to further analysis by the economist. This eventuality needs to be clearly stipulated and accounted for in project planning and budgeting done by the EIA practitioner.

The need for further study can, however, only be determined once the other specialist inputs 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 economic inputs. 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.

Other parts of the economic specialist study that do not deal with environmental externalities can proceed at the same time as the other specialist studies.
An alternative, but at this stage not practical approach in South Africa, 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.

8.8 ENSURING APPROPRIATE STAKEHOLDER ENGAGEMENT

The economist may need to obtain input from, or engage, key stakeholders over and above those involved in the main EIA process. The specialist may, for example, need to consult with the provincial and or national departments of economic affairs, trade and industry and the national treasury. In addition, where potentially significant impacts on socio-economic systems and livelihoods are likely, it may be appropriate to involve key affected parties, in co-operation with other specialists (e.g. biodiversity specialists). Additional involvement of these stakeholders should be done in line with the principles established for such engagement in the EIA process, ideally working with the practitioner appointed to carry out stakeholder engagement.

8.9 CLARIFYING CONFIDENTIALITY REQUIREMENTS

Issues of confidentiality need to be discussed by the proponent, EIA practitioner and economic specialist, and specified in the terms of reference where relevant. They may relate to the proponent's need to keep commercial information about the proposed project confidential, or information about the location of highly sought after, protected or critically endangered species which would best be kept confidential in order to safeguard these species. The need for confidentiality may apply to a particular phase of the project only; e.g. in the pre-application planning phase, to avoid raising undue expectations or pre-empting activities which could have a major effect on the proposed project.

PART D : PROVIDING SPECIALIST INPUT

This part of the guideline provides guidance for providing specialist input, as well as identifying the information required by specialists.

9. INFORMATION REQUIRED TO PROVIDE 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, via the EIA practitioner.

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 local, 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.

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.

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.
The involvement of specialists should be based on the need to supply information relevant to the assessment of impacts associated with the development proposal. Gaps in information for geographical areas/ ecosystems or habitats, especially where the information is not readily linked to development impacts, or where impacts can be avoided/mitigated without specialist input, should not be used to motivate for specialist involvement.

9.3 LEGAL, POLICY AND PLANNING CONTEXT

Information describing the affected economic environment should be supplemented by a brief summary of the economic policy and planning context. The local and regional Integrated Development Plan (IDP) for the area should be consulted and supplemented by Spatial Development Frameworks (SDFs) 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.

Policies or plans that provide a vision of the desired future state for the area within which the development is proposed need to be consulted in order to evaluate whether or not the proposed development contributes to, or conflicts with the achievement of this vision.

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 and clearly communicate 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. SPECIALIST INPUT TO IMPACT ASSESSMENT AND RECOMMENDING MANAGEMENT ACTIONS

An economic specialist could provide input at different stages of the EIA process (Section 4). This input could be relatively minor, in the form of a brief professional opinion, or a detailed economic assessment with an associated written report, depending on the nature of the proposed project and the sensitivity and complexity of the receiving environment. In most instances, regardless of the final product and its level of detail, the conceptual thinking followed by any specialist should be similar.

As a general guide the specialist should:

- Consider the **full project cycle**;
- Answer the **"so what" and "to whom"** questions of probable impacts, i.e. what are the likely consequences of impacts, how severe would they be, and who would be affected by these impacts;
- Predict, assess and evaluate potentially significant **direct, indirect and cumulative impacts**, both with and without management actions. The evaluation of significance should be linked to **thresholds of significance**;
- Assess and evaluate impacts for the **different alternatives** and for **different environmental and operating scenarios**, where appropriate;
- Consider not only impacts on the **affected site**, but also impacts **beyond the site boundaries**;
- Assess and evaluate any **opportunities and constraints** posed by the receiving environment/operating context on the proposed development.

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 (Figure 2). This allows elements to be added to the economic input as required and should help the specialist to conduct appropriate studies that consider the necessary impacts without going into unnecessary detail. The following series of questions should be considered in order to determine the economic impacts associated with the proposed project. 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, positive economic impacts can only flow from projects that are financially viable and sustainable (i.e. pass the financial cost benefit test). 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 of the proposed project in an EIA process. 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. If information is not forthcoming the economist has to look for ways of still completing a satisfactory analysis that is less intrusive. 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. This approach is, however, 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 from the proponent 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 in South Africa. 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 should be made available to the economist.

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 answer these questions an economic or social 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 benefiting. Economic cost-benefit is locally

and internationally accepted as the main tool in determining the economic desirability of projects, being used by organizations such as the World Bank Group, the United Nations, the Asian Development Bank and the Organisation for Economic Cooperation and Development (OECD). It can be used to answer the following sequence of questions:

- 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)?

Bear in mind that cost effectiveness analysis (a form of CBA) is a more appropriate tool when the benefits of project alternatives are identical making it possible to compare only their costs (e.g. If three alternative landfill sites offer the same benefits in terms of capacity, only their costs need be compared).

Are the environmental externalities associated with the project significant enough to feasibly outweigh the projects net benefits?

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). If a reasonable chance exists that the negative externalities outweigh the possible net benefits they need to be analysed further. This may 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 process. Consequently, the question should be asked again towards the end of the study. This allows for the possible extension of the economic 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 readily 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 specialist 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 economic 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 provincial 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 provincial 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 process. 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 provincial 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 and 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 skills and technology transfer. 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, however, the positive economic impacts accruing locally and nationally may be limited due to the high import content, reliance on local loans for funding, payment of dividends to foreigners and the employment of a predominantly foreign work force.

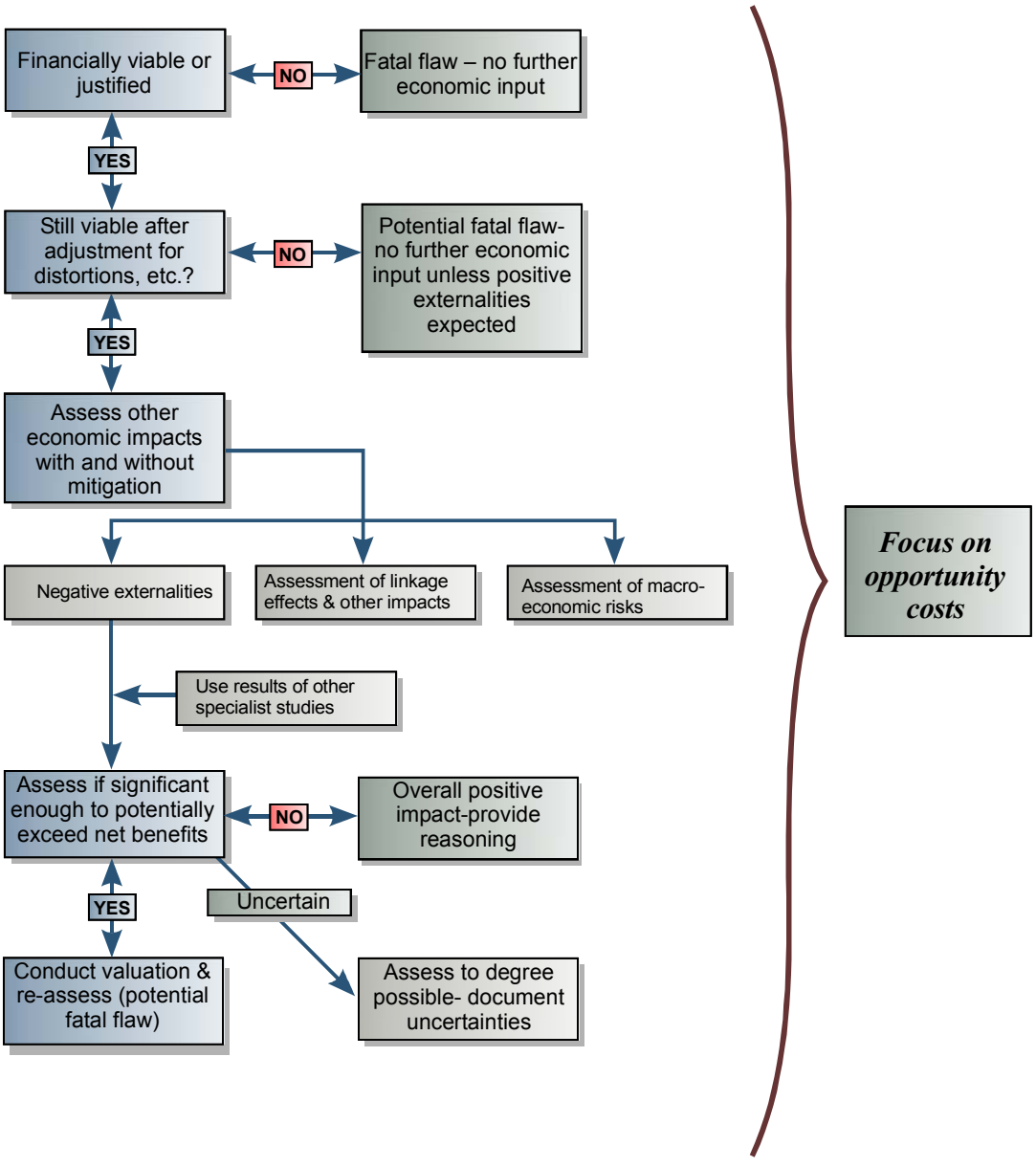


Figure 2: The economic impact assessment process

10.1.1 Techniques available to the specialist

A number of tools or techniques are available to the economic specialist to assist in answering the questions posed above. Figure 3 below shows how the assessment of questions is recommended to proceed sequentially and lists the 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 choose and/or devise ways to assess impacts that are theoretically defensible.

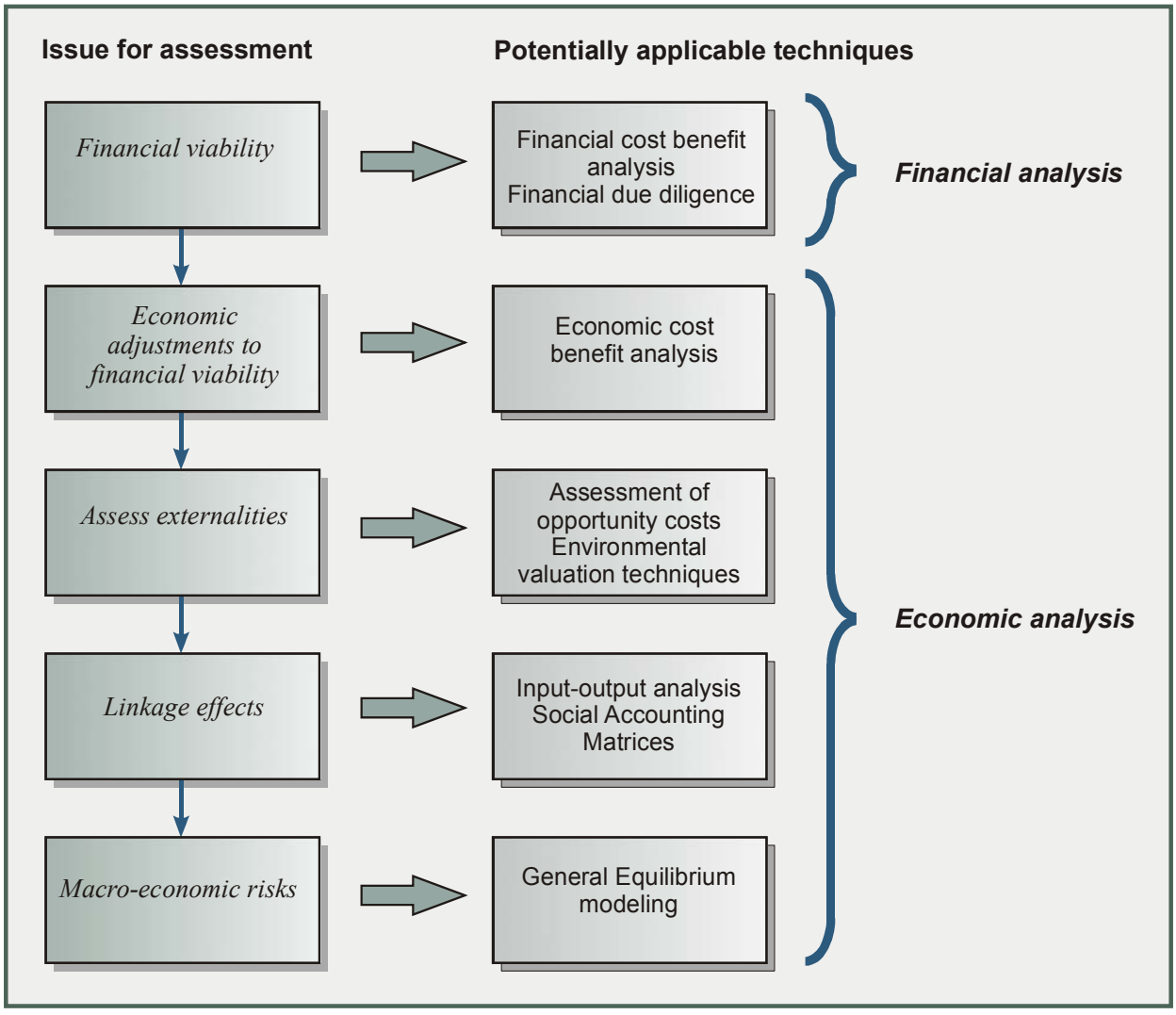


Figure 3: Potentially applicable techniques for economic impact assessment

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 latter form of analysis is often referred to as social cost benefit analysis. Cost effectiveness analysis (CEA) is a form of CBA which can be applied when the benefits of project alternatives are identical making it possible to focus on the comparison of costs only. Table 2 outlines the basic steps in economic CBA as adapted from the South African guidelines on economic CBA (Mullins *et al*., 2002). International guidelines include those of the World Bank (Belli *et al*., 1997).

Table 2: Steps in economic cost benefit analysis

Step	Activity
1	Specification of purpose of the CBA and specification of project boundaries within which the analysis is to be conducted.
2	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.
3	Quantification of cost and benefit streams.
4	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: ▪ Distributional effects between income groups, population groups or geographical regions; ▪ Welfare consequences; ▪ Environmental impacts; ▪ Political and constitutional implications; ▪ Strategic consequences; ▪ The creation of temporary and permanent job opportunities; ▪ The achievement of economic independence; and ▪ Population movements including migration.
5	Discounting of project cost and benefit streams to present values
6	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 and 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[5].
7	Sensitivity analysis on the cost and benefit streams. The analysis should be based on risk factors, which have been identified in the project setting.
8	Interpretation and reporting of the results of the analysis.

Source: Adapted from Mullins et al. (2002)

[5] 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 coefficients 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 INTERPRETING 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 economic specialists. 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; and
- The vulnerability of the groups impacted on.

The determination of impact significance needs to consider the predicted impact of the proposed development in light of the planned vision for the area, rather than only in terms of the impact on the current baseline conditions. For example, if a housing development is proposed in an agricultural area which planning processes have earmarked for residential development, the potential economic impact is of lower significance than if the area had high agricultural potential and was earmarked for agriculture.

The impact criteria used in EIA processes and as outlined in Box 5 does provide some consistency in reporting between the different specialists studies. However, economic specialists studies that take the form of cost-benefit analyses expressed in monetary terms provide a yardstick of relative impacts and therefore do not really need such a reporting framework. When such relative values have not been quantified or qualitatively prioritized, or when impacts cannot be monetized, these assessment criteria can be useful.

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. a positive impact of “high” significance is when the project could reduce local unemployment by 5% or more).

Source: Adapted from the criteria provided by Department of Environmental Affairs and Tourism, 1998

10.3 ESTABLISHING THRESHOLDS OF SIGNIFICANCE

Thresholds of significance define the level or limit at which point an impact changes from low to medium significance, or medium to high significance. These thresholds are often determined by current societal values which define what would be acceptable or unacceptable to society and may be expressed in the form of legislated standards, guidelines or objectives.

Determining acceptable thresholds of significance with regard to the generation of environmental externalities or the general degradation of the environment is primarily the responsibility of the specialists involved in biophysical 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 thresholds of significance 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.

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 – BENEFICIARIES AND LOSERS

Part of the assessment of positive and negative impacts, or costs and benefits, should include a consideration of who benefits and who loses from the impacts associated with the proposed project. The assessment of distributional impacts can form part of economic 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.

Project proponents sometimes promise to assist local communities by funding social upliftment initiatives (such as clinics or schools). These initiatives should not be regarded as benefits as they are simply a redistribution of existing benefits. In other words, the proponent takes some of the income from the project (a benefit) and re-directs it to the community. While they do not add to overall benefits, they can have positive impacts in terms of the distribution of benefits. The

distribution of costs and benefits should be investigated particularly when more than one alternative is being compared.

10.5 IDENTIFYING KEY UNCERTAINTIES AND RISKS

The specialist must identify and communicate any key uncertainties and risks associated with the accuracy of their economic inputs, as well as of the proposed project.

One of 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. While the economic specialist can comment on viability, he/she cannot be expected to delve deeply into the viability calculations upon which developers are basing their belief in the viability of a project.

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.

10.6 JUSTIFYING UNDERLYING ASSUMPTIONS

The economic specialist needs to clearly spell out any assumptions used. The reasons or justification for their use also needs to be given. 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

10.7 DEFINING CONFIDENCE LEVELS AND CONSTRAINTS TO INPUT

The level of confidence that the economic specialist has in his or her inputs should be clearly stated. A scale from low to high should be used to rate the level of confidence associated with predictions.

Constraints and limitations on inputs should be spelt out along with their implications for accuracy and reliability of inputs.

10.8 RECOMMENDING MANAGEMENT ACTIONS

Management actions include planning and design changes that enhance benefits associated with a proposed development, or avoid, mitigate, restore, rehabilitate or compensate for negative impacts.

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 management actions to avoid or minimise negative impacts 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 management beyond this point may lead to additional environmental and societal benefits, but will come at a higher economic cost. Although it may be tempting to recommend management beyond these levels, it may not be justified on economic grounds.

Negative economic impacts or externalities often stem from biophysical 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 biophysical impacts should be identified by the economic specialist bearing in mind possible cost implications. Management actions for economic impacts often overlaps that for social impacts. Cooperation 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 discourage 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.

10.9 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, from the perspective of economic impacts, 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.

10.10 COMMUNICATING THE FINDINGS OF THE SPECIALIST INPUT

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.

In order to answer the “so what” question, specialist assessments provided during the impact assessment stage of the EIA process must include the following:

- Summary table of positive and negative impacts associated with different alternatives and their significance before and after mitigation or enhancement, using the defined impact assessment and significance rating criteria;
- Clear indication of whether impacts are irreversible or result in an irreplaceable welfare loss to society;
- A statement as to whether or not the proposed project would comply or be consistent with international conventions, treaties or protocols and with national, provincial and local legislation, policies and plans as applicable;
- The need, where relevant, for higher order assessment to address potentially significant cumulative effects, or issues which fall outside the scope of the EIA process;
- Statement of impact significance for each issue and alternative, before and after management, specifying whether thresholds of significance have been exceeded;
- Identification of beneficiaries and losers from the proposed development;
- Specification of key risks and uncertainties that may influence the impact assessment findings, including a clear statement of limitations and/or gaps in knowledge or information;
- The specialist’s assumptions and 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;
- References for all sources of information and/or data used.

11. SPECIALIST INPUT TO MONITORING PROGRAMMES

Monitoring means to observe, take samples or measure specific variables in order to track changes, measure performance or compliance and/or detect problems. Monitoring is generally only considered appropriate where changes are probable or likely, and where these changes could be significant and would require remedial or specific management measures.

Monitoring may be carried out to:

- Ensure that mitigation or enhancement measures are implemented;
- Evaluate whether mitigation or enhancement is having the expected and desired effect;
- Improve available data or information;
- Determine whether or not predicted impacts are occurring and/or whether or not the models or other tools used to predict impacts are appropriate and useful;
- Check compliance with legal and/or other requirements with regard to environmental quality (compliance monitoring);
- Determine the intensity of impacts and allow for timeous and effective remedial action where necessary, particularly where prediction of such impacts was uncertain because of lack of prior experience and/or scientific knowledge.
- Detect warning signs that significance thresholds or environmental targets are being exceeded or will be exceeded, to allow for prompt remedial action and/or adaptive management through the life of the project to minimise negative effects.

- Evaluate the accuracy of the EIA in predicting impacts, and allow for changes to an EMP or EMS accordingly.

Monitoring can be carried out ***prior to the construction phase*** (to establish a reliable benchmark), or during the ***construction***, ***operational*** and/or ***decommissioning*** phases of a project, depending on the particular risks of significant impacts during these phases and/or the need to monitor compliance with requirements.

Monitoring programmes should include:

- The specific questions to be answered by monitoring;
- The frequency and/or time of monitoring;
- Responsibility for carrying out monitoring;
- Indicators to use in monitoring. The choice of indicators would depend on the particular impacts predicted, and the receiving environment. Since monitoring often has to consider natural fluxes as well as human-induced effects, complementary indicators may be appropriate in monitoring. Indicators should be specific, measurable, achievable, relevant and timely. Where possible, the choice of indicators should be aligned with key national and

provincial indicators;

- Significance thresholds or thresholds of probable concern (Section 10.3), which would trigger remedial action or other intervention;
- Responsibility for analysing and evaluating the results of monitoring, and for implementing adaptive management in response;
- Reporting requirements.

Monitoring must be tied in to an effective decision-support system which triggers appropriate management changes depending on the results of monitoring, and clearly identifies who would be responsible for implementing that management.

Monitoring programmes linked to economic impacts are scarce in South African EIA practice, possibly because monitoring has tended to focus on biophysical 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 (including future economic development planning objectives) 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 fulfil this role. Monitoring may also be required to be sure that any agreements for the procurement of local materials and plant are adhered to. Any other monitoring requirements will be determined by the nature of the project. For example, monitoring whether foreign exchange inflows predictions are met may be relevant if these are assessed to be a major benefit of a large industrial plant.

PART E: REVIEW OF SPECIALIST INPUT

This part of the guideline identifies specific review criteria that can be used as a quality check.

12. SPECIFIC EVALUATION CRITERIA

Reference should be made to the *Guideline for the review of specialist input in EIA processes* for the generic review criteria that can be applied to any specialist input. This section only provides specific guidance on reviewing economic input.

This guideline has outlined what should be expected of economic specialist input. Specific aspects that should be present in any high quality assessment include an explicit consideration of opportunity costs, the answering of the primary questions needed for economic impact assessment (as outlined in section 10.1) and a clear indication that theoretically rigorous methods and techniques were applied.

Generic aspects that determine a high quality specialist input include the following:

- Appropriate analysis has been conducted given the scale of the project;
- The project has been considered within its wider context;
- Sources of information and references are provided;
- Assumptions, limitations and level of confidence in inputs have been spelt out;
- Alternatives have been evaluated and the best practicable option has been recommended;
- Management recommendations are sensible and practical; and
- All the economic issues raised in scoping have been addressed.

13. REFERENCES

Asian Development Bank. 2005. Internet: http://www.adb.org/Documents/Guidelines/ Eco_Analysis/appendix24.asp

Belli P., Anderson. J., Barnum, H., Dixon, J. & Tan, L. 1997. *Handbook on Economic Analysis of Investment Operations.* World Bank, Washington DC.

Cooper, L.M. 2004. *Guidelines for Cumulative Environmental Assessment in SEA of Plans*. EMPG Occasional Paper, May 2004. http://www.env.ic.ac.uk/research/empg.

Crookes, D.J. & de Wit, M.P. 2002. Environmental economics and its application in environmental assessment in South Africa: an evaluation of the status quo. *Impact Assessment and Project Appraisal*, June: 127-34.

Dennis Moss Partnership (DMP). 2000. *Bioregional Planning Framework For The Western Cape Province.* Department of Planning, Local Government and Housing: Provincial Government of the Western Cape.

Department of Environmental Affairs and Tourism (DEAT). 1998. *Guideline Document: EIA Regulations – Implementation of Sections 21, 22 and 26 of the Environment Conservation Act.* Department of Environmental Affairs & Tourism, Pretoria.

Department of Environmental Affairs and Tourism (DEAT). 2002. *Specialist Studies, Integrated Environmental Management Information Series 4.* Department of Environmental Affairs and Tourism, Pretoria.

Department of Environmental Affairs & Tourism (DEAT). 2004a. *Criteria for Determining Alternatives in EIA, Integrated Environmental Management Information Series 4.* Department of Environmental Affairs and Tourism, Pretoria.

Department of Environmental Affairs & Tourism (DEAT). 2004b. *Cumulative Effects Assessment, Integrated Environmental Management Information Series 4.* Department of Environmental Affairs and Tourism, Pretoria.

Department of Agriculture and Land Affairs. 2001. *Wise Land Use - White Paper on Spatial Planning and Land Use Management.* Notice 1646 of 2001.

De Wit, M.P. & Crookes, D.J. 2001. *Guidelines for the use of environmental economic tools in environmental assessments – 2001*. CSIR Report ENV-P-I 2001-037, Pretoria.

Dixon, J.A., Scura, L.F. Carpenter, R.A. & Sherman, P.B. 1994. *Economic Analysis of Environmental Impacts*. Published in Association with the Asian Development Bank and the World Bank. Earthscan, London.

Georgiou, S., Whittington, D., Pearce, D. & Moran, D. 1997. *Economic Values and the Environment in the Developing World*. Edward Elgar, Cheltenham, UK.

Leiman, A. & van Zyl, H.W. 2004. Economics in Impact Assessment: The Role of Environmental and Resource Economics. In: Blignaut, J.N & de Wit, M.P. (Eds) *Sustainable Options: Development Lessons From Applied Environmental Economics.* UCT Press, Cape Town.

Lumby, A. & Blignaut, J.N. Economic Valuation. In: Blignaut, J.N. & de Wit, M.P. (Eds) *Sustainable Options: Development Lessons From Applied Environmental Economics.* UCT Press, Cape Town.

Mullins, D., Gehrig, G., Mokaila, G.E., Mosaka, D., Mulder, L. & Van Dyk, E. 2002. *A manual for cost benefit analysis in SA with specific reference to water resource development.* WRC Report Number: TT 177/02. WRC, Pretoria.

Pearce, D.W. & Turner, R.K. 1990. *Economics of Natural Resources and the Environment.* Harvester Wheatsheaf, London.

Provincial Government of the Western Cape (PGWC): Department of Economic Development and Tourism. 2004. *Strategic Plan 2004/2005 to 2006/2007*. PGWC, Cape Town.

Weaver, A., Rossouw, N. & Grobler, D. 1999. Scoping and "Issues Focused" Environmental Impact Assessment in South Africa. *African Journal of Environmental Assessment and Management,* 1 (1): 1-11.

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

Wierenga, M. 2003a, A brief introduction to Environmental Economics from "The Chartered Institution of Water and Environmental Management" (CIWEM) Environmental Economics. p.2. http://www.ciwem.org.uk/policy/policies/economics/index.asp

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

Cost benefit analysis	Economic technique in which costs and benefits are identified, quantified where possible and weighed up against each other.
Environmental economics	Sub-discipline of economics focusing on the analysis of environmental issues. Also known as resource economics or referred to as 'environmental and resource economics'.
Environmental externality	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).
Environmental valuation	Quantifying the monetary value of environmental impacts using economic techniques.
Fatal flaw	A fatal flaw is defined as an impact that could have a "no-go" implication for the project.
Impact significance	A term used to evaluate how severe an impact would be, taking into account objective or scientific data as well as human values. A specific significance rating should not be confused with the acceptability of the impact (i.e. an impact of low significance is not automatically "acceptable").
Induced effects	See linkage effects.
Key issue	An issue raised during the scoping process that has not received an adequate response and which requires further investigation before it can be resolved.
Linkage effects	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.
Macro-economics	Focused on economic issues at a national and sometimes regional scale.
Management actions	Actions – including planning and design changes - that enhance benefits associated with a proposed development, or that avoid, mitigate, restore, rehabilitate or compensate for the negative impacts.
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.
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.

ACRONYMS

BAT	Best available technology
BCR	Benefit:Cost ratio
BPEO	Best Practicable Environmental Option
CBA	Cost benefit analysis
CGE	Computable General Equilibrium (model)
DEA&DP	Department of Environmental Affairs and Development Planning
DEAT	Department of Environmental Affairs and Tourism
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
I&AP	Interested & affected party
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IRR	Internal rate of return
OECD	Organisation for Economic Cooperation and Development
SAM	Social Accounting Matrices
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment

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) Assumptions, limitations and uncertainties
6) Approach to be used
7) Requirements to attend meetings and workshops
8) Requirements to liaise and exchange information with other specialists
9) Protocol for stakeholder engagement
10) Report template providing structure of contents, formatting styles and standard terminology (including impact assessment criteria if applicable)
11) Clarification of review and integration process
12) Requirements for specialist sign off on the specialist report and inputs to integrated reports
13) Summary of tasks, deliverables and due dates
14) Budget and payment schedule, including penalty clause for late delivery
15) Confidentiality agreement
16) Protocols for communication with outside parties during the project