



Integrated Environmental Management Information Series

Overview of Integrated Environmental Management



Department of
Environmental Affairs and Tourism

Other topics in the series of overview information documents on the concepts of, and approaches to, integrated environmental management are listed below. Further titles in this series are being prepared and will be made available periodically. Sequence of release and titles are subject to change.

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Information Series 1:	Screening
Information Series 2:	Scoping
Information Series 3:	Stakeholder Engagement
Information Series 4:	Specialist Studies
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ISSUED BY

Department of Environmental Affairs and Tourism
 Private Bag X447
 Pretoria
 0001 South Africa

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ENQUIRIES AND COMMENTS

All enquiries and comments should be addressed to:
 The Director: Environmental Impact Management
 Department of Environmental Affairs and Tourism
 Private Bag X447
 Pretoria
 0001 South Africa

REFERENCING

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PREFACE

This document is one of a series of overview information documents on the concepts of, and approaches to, integrated environmental management (IEM). IEM is a key instrument of South Africa's National Environmental Management Act (NEMA). South Africa's NEMA promotes the integrated environmental management of activities that may have a significant effect (positive and negative) on the environment. IEM provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. It includes the use of several environmental assessment and management tools that are appropriate for the various levels of decision-making.

The aim of this document series is to provide general information on techniques, tools and processes for environmental assessment and management. The material in this document draws upon experience and knowledge from South African practitioners and authorities, and published literature on international best practice.

This document is aimed at a broad readership, which includes government authorities (who are responsible for reviewing and commenting on environmental reports and interacting in environmental processes), environmental professionals (who undertake or are involved in environmental assessments as part of their professional practice), academics (who are interested in and active in the environmental assessment field from a research, teaching and training perspective), non-government organisations (NGOs) and interested persons. It is envisaged that this document will also be of interest to practitioners, government authorities and academics from around the world.

This document has been designed for use in a South African context and it cannot reflect all the specific requirements, practice and procedures of environmental assessment in other countries.

This series of documents is not meant to encompass every possible concept, consideration, issue or process in the range of environmental assessment and management tools. Proper use of this series of documents is as a generic reference, with the understanding that it will be revised and supplemented by detailed guideline documents.

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Note

All sources used have been acknowledged by means of complete references.

Principal Authors	Paul Lochner, Alex Weaver, Shamini Naidu and Chantal Will (CSIR)
Project Co-ordinators	Anben Pillay (DEAT) and Nigel Rossouw (CSIR)
Editorial Review	Pat Morant, Nigel Rossouw (CSIR) and Anben Pillay (DEAT)
Peer Review	Johan Nel (Centre for Environmental Management, North West University) Peter Tarr and Peter Croal (Southern African Institute for Environmental Assessment)
Departmental Review	Mark Gordon, Danie Smit and Coenrad Agenbach (DEAT)

SUMMARY

This document describes the concepts, principles and tools of Integrated Environmental Management (IEM). The purpose of the document is to inform all stakeholders who are involved in making decisions that could have an impact on the environment about the range of tools available to align their endeavours with the principles of sustainable development. It should be noted that this document is not intended as a detailed users guide, but rather to convey the overall framework for integrated environmental management.

The evolution of integrated environmental management in South Africa built onto international experience in environmental policy and the application of environmental assessment and management tools. An overview is provided of the emergence of environmental assessment and management globally, followed by a summary of the development of IEM in South Africa. Based on this review, it is recognized that the globally applied term environmental assessment and management is comparable with the South African term integrated environmental management.

IEM is shown to have evolved to be an underlying philosophy and set of principles, supported by a range of environmental assessment and management tools that are aimed at promoting sustainability. IEM has moved away from being defined in terms of particular processes. Rather, it provides a "way of thinking" that can either be used to underpin a stand-alone process (e.g. EIA) or be integrated into existing complementary processes (e.g. integrated development planning).

Initially, IEM in South Africa was associated with authorisations of controlled activities. As IEM has evolved, a broader perspective has emerged. This views IEM as an underlying philosophy and suite of tools that can be infused into decision-making by all sectors of society (e.g. government/public sector, private sector and civil society).

Based on a review of the evolution of IEM, the following definition is compiled to reflect current views:

IEM provides an holistic framework that can be embraced by all sectors of society for the assessment and management of

environmental impacts and aspects associated with each stage of the activity life cycle, taking into consideration a broad definition of environment and with the overall aim of promoting sustainable development.

Based on a review and synthesis of a wide range of relevant principles for environmental policy and environmental assessment and management world-wide, a set of 19 principles are proposed for IEM in South Africa. In order to realise these principles, the user needs to carefully select and combine a suite of tools. These tools can be used in sequence and in parallel. The choice of tools is informed by the needs expressed by stakeholders and decision-makers, the hierarchy of activity being undertaken (e.g. project, plan or policy) and the stage of the activity life cycle (e.g. planning, design, establishment, operations or closure). This document provides a summary of the more commonly used IEM tools.

In conclusion, it is recognised that Integrated Environmental Management provides a set of underpinning principles and a suite of environmental assessment and management tools that are aimed at promoting sustainable development. Many of these tools, such as Environmental Impact Assessment, are well developed and mandatory world-wide. Other tools, such as Sustainability Analysis, are still in an emergent stage. With this suite of tools, IEM has the potential to play a major role in the imperative of guiding all sectors of society along a pathway to sustainability.

Meeting the many challenges South Africa faces in achieving the goal of sustainable development requires co-operation between all spheres of government, community-based organisations, non-governmental organisations, researchers and academics, business and environmental practitioners.

Constructive interactions between all of these stakeholders in the spirit of continual improvement will ensure that the country continues to play a leading role in developing and implementing innovative approaches to IEM.

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1. INTRODUCTION

The concept of Integrated Environmental Management (IEM) has been promoted in South Africa since the late 1980s. In 1992, IEM was widely communicated via the release of the Integrated Environmental Management Guidelines Series - a series of six documents published by the Department of Environment Affairs (DEA, 1992). Although the underpinning principles and concepts articulated in these documents have generally been well accepted and become an integral part of environmental assessment and management in South Africa, the need has emerged for an updated synthesis of current thinking on IEM.

2. PURPOSE OF THIS DOCUMENT

This document describes the concepts, principles and tools of Integrated Environmental Management. The purpose of the document is to inform all stakeholders who are involved in making decisions that could have an impact on the environment about the range of tools available to align their endeavours with the principles of sustainable development. It should be noted that this document is not intended as a detailed user's guide, but rather to convey the overall framework for integrated environmental management. For more detail on the specific tools referred to in this document, the reader is referred to the complementary documents in the Integrated Environmental Management Information Series published by the Department of Environmental Affairs and Tourism (DEAT).

The document is structured by firstly providing an historical overview of the emergence of environmental assessment and management globally, leading into a summary of the growth of the South African form of environmental assessment and management, called Integrated Environmental Management (IEM). A synthesis of IEM principles and tools is provided, and a conceptual model that provides an organisational framework for understanding when and where to utilise these tools is proposed. In its original form, the term IEM was used in South Africa to describe a particular procedure. Today the term is used more in its literal sense and applied in a wide range of circumstances, underpinned by a set of principles and supported by a suite of tools.

Box 1: Key definitions and understandings that set the context for this document

- * **Definition of “environment”**: an holistic definition of the term “environment” is adopted, that includes biophysical, social and economic components, as well as the connections within and between these components.
- * **Definition of “activity”**: IEM can be applied across a range of activities, including policies, plans and programmes, and projects.
- * **Definition of “stakeholders”**: IEM can apply to all stakeholders - with the term “stakeholders” including government authorities, the proponent and interested and affected parties (I&APs). I&APs could include environmental practitioners, academics, non-governmental organisations (NGOs), community-based organisations (CBOs) and business.

This document does not attempt to propose a new set of IEM principles and tools, but rather to synthesize and present a summary of principles and tools based on international examples and past experience with the implementation of IEM tools. Links are made to the other documents in this IEM information series published by DEAT, which provide further information on many of the tools that are used in effective integrated environmental management. Key definitions that set the context for IEM are provided in Box 1.

3. OBJECTIVES AND CONTEXT OF IEM

IEM provides a suite of principles and tools to guide South Africa on a path to sustainable development. Although there are numerous and varied definitions of the term sustainable development, the common elements include the need to integrate social, economic and environmental features as well as to address intra- and inter-generational equity (Box 2). The Southern African Development Community's goals for sustainable development (Box 2) emphasize the importance of a people-centred approach in the context of developing countries.

This shift in emphasis was echoed in the outcomes of the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 (United Nations, 2002). Furthermore, the fundamental principles of sustainable development are entrenched in the Constitution of the Republic of South Africa, 1996 (Box 3).

Box 2: Relevant definitions of sustainable development

Global

Our Common Future (WCED, 1987) defines sustainable development as:

Development that meets the needs of the present without compromising the ability of future generations to meet their needs and aspirations.

Regional

The sustainable development goals of the Southern African Development Community (SADC, 1996) are to:

- * Accelerate economic growth with greater equity and self-reliance;
- * Improve the health, income and living conditions of the poor majority; and
- * Ensure equitable and sustainable use of the environment and natural resources for the benefit of present and future generations.

National

The South African National Environmental Management Act (NEMA, Act 107 of 1998) defines sustainable development as follows (section 1(1)(xxix)):

Sustainable development means the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Box 3: Environmental rights of people in the South African Bill of Rights

In terms of Section 24 (a) of the Bill of Rights in the South African Constitution (Act 108 of 1996), everyone has the right:

- (a) to an environment that is not harmful to their health or well-being; and
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
 - * prevent pollution and ecological degradation
 - * promote conservation; and
 - * secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

4. HISTORICAL OVERVIEW OF INTEGRATED ENVIRONMENTAL MANAGEMENT

The evolution of integrated environmental management in South Africa built onto international experience in environmental policy and the application of environmental assessment and management tools. This section provides an overview of the emergence of environmental assessment and management globally, with key evolutionary features summarised in Table 1. This is followed by an overview of the development of IEM in South Africa, recognizing that the globally applied term environmental assessment and management is comparable with the South African term integrated environmental management.

4.1 *Global evolution of environmental assessment and management*

4.1.1 *The first decade: origins in the USA*

The promulgation of the National Environmental Policy Act of 1970 (NEPA) in the United States is recognized worldwide as the event that saw the formalisation of the first tool for environmental management, i.e. environmental impact assessment (EIA). One of the primary aims of NEPA was to support decision-making by identifying and investigating the environmental consequences of a proposed activity, with the main implementation instrument of NEPA being EIA.

NEPA reflected a fundamental change from an economic expansionist view of a world with open frontiers and unlimited resources; to the realisation that supply of natural resources was finite. It also reflected a change from a narrow focus on the technical, engineering and financial requirements of activities; to recognition of the environmental (i.e. ecological) consequences of human actions.

During this first decade of EIA, several well-defined and pragmatic methods were developed. In order to deal with the recognised complexity of environmental systems, the environment was fragmented into discrete components in order to assess specific impacts of actions - such as impacts on air, impacts on water and impacts on soils (Weaver et al, 1999). In retrospect, environmental assessment is claimed to have been one of the most successful policy innovations of the 20th century (Bartlett, 1988) and provided the first widely applied method in a suite of rapidly developing tools for environmental assessment and management.

4.1.2 *The second decade: enhancement of the social dimension of environmental assessment*

The 1980s saw an emphasis on effective stakeholder engagement and the infusion of conflict resolution into the EIA process. Linked to this was the identification and integration of social issues and societal values into EIA. The 1980s also saw the identification of scoping as a method to identify and focus the EIA on key environmental issues.

The rapid growth in technology and economic development, that led to the environmental problems and triggered the promulgation of NEPA in the United States, also prevailed in other Western countries (Sadler, 1996). Concern for the environment emerged as a globally important matter. This led to the rapid adoption and application of EIA throughout the world, in some cases as a mandatory requirement and elsewhere as a discretionary tool. The creation of environmental policies and programmes in developing countries has been motivated by different factors, and

thus proceeded quite differently than in Western countries where EIA originated.

In Western countries, EIA was borne from demands by the general population and was thus a “bottom-up” initiative. In the developing world, environmental assessment requirements started being institutionalised either in national policy or via the policies of funding and international agencies such as the World Bank as a result of international pressures to respond to environmental problems (Boyle, 1998). There is, therefore, less widespread acceptance of tools like EIA by the general public in developing countries, where it is often seen as an additional cost and a hindrance to development rather than an aid (Weaver, 2003).

4.1.3 *The third decade: emergence of sustainable development as a global concept*

During the late 1980s to early 1990s, two initiatives of global significance pushed the concept of sustainable development on centre stage. These were: (i) the publishing of Our Common Future (WCED, 1987) which concluded that a rapid deterioration of the global environment was threatening life on earth and that decisive political action was needed; and (ii) the holding of the 1992 United Nations Conference on Environment and Development, commonly known as the Rio Earth Summit (UNCED, 1992).

These and other events during the 1990s heralded an increased awareness of the global implications of unsustainable development on human well-being in both developed and developing countries. This led to attention being focused on the role of environmental assessment and management approaches to reverse this trend. New tools that were developed to meet this challenge include Strategic Environment Assessment (which is aimed at including environmental considerations earlier in the process of formulating policies, plans and programmes) and environmental justice (which is aimed at promoting the fair and equitable distribution of environmental goods, services and resources).

The publication of the Key Outcomes and Commitments of the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 gave formal recognition to the role of environmental assessment in driving sustainable development. For example, this recognition is reflected in chapter 3 on Patterns of consumption and production; in chapter 4 on Protecting the natural resource base; in chapter 8 on Sustainable development for Africa; and in chapter 9 on Means of implementation (United Nations, 2002).

Table 1: Key features of environmental assessment and management tools from the 1970s to the present

1970s	1980s	1990s to present
Focus on biophysical impacts	Incorporation of social issues and impacts	Emergence of sustainable development as a global imperative
Adversarial relationship between proponent and public, manifested in numerous legal battles	Re-aggregation of ecosystemic wholes i.e. Incorporation of approaches to assess the overall impact of activities on natural systems	Application of IEM tools earlier in the planning and design process
EIA discipline established & well-defined methods developed	Improved stakeholder engagement in the process	Evolution of new tools to address wider political and sustainability issues (e.g. Strategic Environmental Assessment)
Technocratic focus on product/problem solving and little focus on the stakeholder engagement process	Introduction of scoping to focus on key issues	Widespread adoption of non-regulated processes to promote ongoing environmental management (e.g. environmental management systems)

4.2 Evolution of Integrated Environmental Management in South Africa

South Africa was slow to develop and institute formal procedures for environmental assessment. It was only with the enactment of the Environment Conservation Act (Act 73 of 1989) that provision was made to determine environmental policy to guide decision-making and to prepare environmental impact reports (Sowman et al, 1995).

The publication of a document entitled Integrated Environmental Management in South Africa (Council for the Environment, 1989) marked the introduction of this concept to South Africa. The term IEM was chosen to indicate a general approach that integrates environmental considerations across all stages of the planning and development cycle and would be applicable to policies, programmes, plans and projects (Sowman et al, 1995). It was felt that the term EIA was inappropriate because of connotations of being anti-development and being associated with legal conflicts and costly delays. It was recognized that, to be effective, the approach to environmental evaluation in South Africa would need to be flexible, generally applicable, widely accepted and practical to implement (Sowman et al, 1995). A revised IEM procedure and a series of guideline documents was published by the Department of Environment Affairs (1992). These documents have been used extensively, in particular through providing a set of twelve principles that underpin the IEM philosophy for South Africa.

The 1992 IEM documents focused on the EIA phase of development, with little emphasis on environmental management and ongoing monitoring during implementation. This was partly due to timing, as the first set of national specifications for environmental management systems, the British Standard BS 7750 (1992), was released in the same year. Current practice recognizes the need to place greater emphasis on the implementation phase of activities through the inclusion of environmental management systems (Heydenrych and Claassen, 1998; Hill, 2000).

Although South Africa has a proud history of voluntary EIA practice dating back to the 1970s, it was only in September 1997 that the government gazetted regulations enforcing EIA, in terms of the Environment Conservation Act (Act 73 of 1998). The publication of the National Environmental Management Act (Act 107 of 1998) (NEMA) followed shortly thereafter. This Act provides the framework for co-operative environmental governance in South Africa and promotes the application of environmental assessment and management tools to ensure integrated environmental management of activities (chapter 5, section 23(1)). Section 23 of this Act provides the general objectives of integrated environmental management; whereafter Section 24 outlines what procedures must be implemented in order to achieve these objectives.

The South African national Department of Environmental Affairs and Tourism (DEAT) is actively promoting integrated environmental management. This is being achieved through the development and implementation of environmental policy and legislation; as well as training, communications and awareness programmes such as the information series of which this document forms a part.

In summary, this section on the evolution of IEM in South Africa has shown that during the 1990s the philosophy of IEM became well rooted in South African thinking. However, the implementation of IEM was largely focused on one tool, i.e. environmental impact assessment, that focused on new project proposals. Looking ahead, a key challenge is to support sustainable development through the use of a wider range of environmental assessment and management tools across the full activity life cycle and by all sectors of society.

5. MISUNDERSTANDINGS AND CONFLICTING USES OF THE TERM “IEM”

It is a natural and desirable process for environmental assessment and management practice and theory to evolve, diversify in application, consolidate methodologies and learning, and progress into new areas of application. A consequence of this, however, is that over the past decade in South Africa the term Integrated Environmental Management has been interpreted in many different ways.

Based largely on an analysis by Nel and du Plessis (2003), three conflicting uses and incomplete interpretations of the term IEM are presented below.

5.1 Integrated Environmental Management as Environmental Impact Assessment

The term IEM is often equated with the concept of EIA. This view probably originates from the IEM Guideline Series of documents published in 1992, which states that:

“Integrated Environmental Management (IEM) is designed to ensure that the environmental consequences of development proposals are understood and adequately considered.... The purpose of IEM is to resolve or mitigate any negative impacts and to enhance positive aspects of development proposals” (DEA, 1992: 5).

This indicates that the IEM procedure was focused on assessing the impacts of new, discrete development proposals. However, since the publishing of these 1992 Guidelines, it has been recognised that there are several other impacts that require environmental management, besides those originating from individual project level proposals. There is also need for tiered levels of decision-making, rather than the single decision-making phase proposed in the 1992 IEM procedure (Heydenrych and Claassens, 1998). This is leading to more attention being given to ongoing environmental management during the implementation of activities.

5.2 IEM as the mechanism for co-operation among government departments

The IEM concept is often used to refer to the increased efforts being made at aligning and giving common direction to the policies, programmes, plans, projects and institutional arrangements of government with regard to the environment.

In South Africa, the administration of legislation applying to environmental media (e.g. air, land use, soil, natural resources, water and waste) at a national level is to a large extent still as fragmented as it was prior to the first democratic elections of 1994. NEMA recognises this fragmented nature, and responds by providing various mechanisms and forums for promoting integration in order to achieve alignment amongst organs of state. This is based on the recognition within NEMA that control over environmental issues is vested in numerous organs of state that operate at different spheres of government (i.e. national, provincial and local government). However, it is argued that using the term IEM to mean alignment of fragmented and disjointed steps towards government of environmental resources in South Africa, does not reflect a full understanding of the IEM concept (Nel and du Plessis, 2003).

5.3 IEM as the adoption of NEMA principles across all spheres of government

Another use of the term IEM stems from the adoption and use of the IEM principles (from NEMA) by different organs of state, operating at different spheres of government. For example, the IEM principles from NEMA are adopted in the recent bills and legislation for management of biodiversity, petroleum development resources, and integrated pollution and waste management. This indicates that the NEMA-based principles are being used by line functions other than DEAT, at various spheres of government. Nel and du Plessis (2003) conclude that this adoption of IEM principles by these organs of state does indeed amount to integrated environmental management (in the literal meaning of the words) as NEMA’s provisions have been integrated into their own line function activities.

6. DEFINITION, CONCEPTS AND PRINCIPLES

IEM has evolved to be an underlying philosophy and set of principles, supported by a range of environmental assessment and management tools that are aimed at promoting sustainability. IEM has moved away from being defined in terms of particular processes. Rather, it provides a “way of thinking” that can either be used to underpin a stand-alone process (e.g. EIA) or be integrated into existing complementary processes (e.g. integrated development planning). This set of principles and tools provides a framework for environmental decision-making.

Initially, IEM in South Africa was associated with authorisations of controlled activities. As IEM has evolved, a broader perspective has emerged. This views IEM as an underlying philosophy and suite of tools that can be infused into decision-making by all sectors of society (e.g. government/public sector, private sector and civil society).

6.1 Definition of IEM

Based on a review of the evolution of IEM, the following definition is compiled to reflect current views:

IEM provides a holistic framework that can be embraced by all sectors of society for the assessment and management of environmental impacts and aspects¹ associated with an activity² for each stage of the activity life cycle³, taking into consideration a broad definition of environment⁴ and with the overall aim of promoting sustainable development.

Explanatory notes:

¹ Where an environmental aspect is an element of an organisation’s activities, products or services that can interact with the environment (as defined in the ISO 14001 specification).

² Where activity includes a policy, plan, programme, or project, either being planned or implemented.

³ At the project level, this refers to the cycle of initiating/planning, design, establishment/ construction, operations/implementation and closure. At the policy level, this refers to the cycle of issue identification, options analysis, evaluation and monitoring.

⁴ That includes biophysical, socio-economic and institutional components in an integrated systemic manner.

6.2 Unpacking the IEM concept

The defining words in the term “Integrated Environmental Management” were chosen carefully and are unpacked below:

What is meant by “integration”

- * Integration of environmental considerations across the full life cycle of the activity: for example, for a project, this implies consideration of environmental issues through the pre-feasibility, feasibility, planning and design, construction, operational and decommissioning phases, i.e. a cradle to grave approach, and then the future re-use of the area or resource, i.e. cradle to cradle.
- * Integration of knowledge across specialist disciplines: for example, in specialist studies, tracing and analysing the links between air emissions and potential impacts on human health and subsequent economic costs.
- * Integration of stakeholders: for example, in an EIA, providing effective and constructive interaction between authorities, business and labour, civil society and the proponent.
- * Integration of appropriate tools into the decision-making process (for example, in an EIA, integration of human health risk assessment in air quality dispersion modelling) as well as across the full activity life cycle (for example, linking EIA to EMS and environmental reporting).

What is meant by “environment”

Environment refers to the surroundings in which humans and other organisms exist. The term is used in its broadest sense, to consist of biophysical, social and economic components and the connections within and between these components.

What is meant by “management”

Management refers to the processes of initiating, planning, implementing, controlling and closing an activity, including the associated responsibilities and accountabilities. The classical management cycle (i.e. plan, do, check and act) can also be applied within each stage of the typical activity life cycle.

6.3 IEM principles¹

The following principles underpin IEM:

- i) Accountability and responsibility
The accountability and responsibility of all stakeholders in the process should be clarified for each stage of the activity life cycle, in particular with regard to information provided, decisions taken and implementation requirements.
- ii) Adaptive
The process should be flexible and adjust to the realities,

¹ These principles are based on a review and synthesis of a wide range of relevant principles for environmental policy and environmental assessment and management world-wide. These included the 1992 IEM principles (DEA, 1992), NEMA's national environmental management principles, and principles from IAEA international, Agenda 21, United Kingdom, Australia and other sources.

issues and circumstances of the activities under review, without compromising the integrity of the process; and be iterative, incorporating lessons learned throughout the activity life cycle.

- iii) Alternative options
The process must identify and define all reasonable alternatives and provide the decision-makers with an understanding of the trade-offs that will result from the alternative options. These alternatives could include demands, activities, locations, processes, schedules and/or inputs (e.g. raw materials or energy sources).
- iv) Community empowerment
Community well-being and empowerment should be promoted through knowledge sharing and awareness raising programmes in order to build the capacity of people to participate effectively in managing the environment and contributing to sustainable development.
- v) Continual improvement
The process of enhancing the overall environmental performance of an organisation in accordance with that organisation's environmental policy and objectives.
- vi) Dispute Resolution
Processes should be undertaken in a consensus-seeking spirit and aim to minimise or resolve conflicts wherever possible.
- vii) Environmental Justice
Adverse environmental impacts should not be distributed in a manner that unfairly discriminates against any person, particularly vulnerable and disadvantaged persons.
- viii) Equity
Equitable access should be provided to environmental resources, benefits and services to meet basic human needs and promote human well-being for both present and future generations.
- ix) Global Responsibilities
Due consideration should be given to global and international responsibilities and transboundary issues relating to the environment.
- x) Holistic decision-making
Decisions must take into account the interests, needs and values of all interested and affected parties and all relevant forms of knowledge, including traditional knowledge.
- xi) Informed decision-making
The most appropriate methods and techniques must be applied responsibly and rigorously to address issues that really matter and so provide sound and useful information for decision-making.
- xii) Institutional co-ordination
Inter-governmental co-ordination and harmonisation of policies, legislation and actions relating to the environment is required.
- xiii) Integrated approach
Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all components of the environment and all people in the environment.

- xiv) Polluter Pays
The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those primarily responsible for causing these effects.
- xv) Precautionary approach
Adopt a risk averse and cautious approach, in particular where current knowledge is limited, and link this approach to a commitment to continuous improvement.
- xvi) Rigour
Ensure that appropriate techniques and experts in the relevant bio-physical and socio-economic disciplines are deployed, in conjunction with peer review to independently verify the objectivity, professionalism and rigour of the specialist work.
- xvii) Stakeholder engagement
Opportunities for meaningful and timely engagement with all stakeholders, in particular youth, women and vulnerable or disadvantaged groups, to enable them to contribute effectively to informed decision-making.
- xviii) Sustainability
Resources and natural cycles of renewal and replenishment should be utilized in a manner that does not lead to their long-term decline, in order to enable the needs and aspirations of present and future generations to be met.
- xix) Transparency
Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.

Numerous tools for IEM have been described in the literature and it is not the intention of this section to provide a comprehensive listing of these tools. This section provides a summary of the more commonly used IEM tools. These tools can be used by all sectors of society (e.g. government/public sector, private sector and civil society) to inform decision-making that promotes sustainable development. It should be noted that these tools can be applied within a broader context of complementary processes and supporting disciplines (Figure 1):

- * The tools can be used to support complementary policy and planning processes that are closely related to IEM. The IEM tools are not intended to replace these processes, but could be used to provide inputs to these wider processes.
- * The tools are supported by numerous specialist disciplines, which are in turn supported by technologies and methods for sourcing input data.

Commonly used tools in support of integrated environmental management are listed and described in Table 2. References are provided to other documents in the DEAT Integrated Environmental Management Information Series, as well as websites or other useful sources of information on these tools.

These tools are then mapped in terms of the hierarchy of activity and stage in the activity life cycle at which they could be applied (Figure 2). It should be noted that this mapping of tools is indicative and not absolute, as they are constantly evolving and finding new or varied application.

It is important to note that the user needs to carefully select and combine tools, in sequence and in parallel. The choice of tools is informed by the needs expressed by stakeholders and decision-makers, the hierarchy of activity being undertaken (e.g. project, plan, programme or policy) and the stage of the activity life cycle. At the project level, this refers to the cycle of planning, design, establishment, operations and closure. At the policy level, this refers to the cycle of issue identification, options analysis, evaluation and monitoring (Figure 2).

7. SUMMARY OF IEM TOOLS

The principles provided in section 4 can be realised through the application of one or more of a suite of tools, which are used by specialists to support decision-making.

Figure 1: Relationship between IEM tools, complementary processes and supporting disciplines

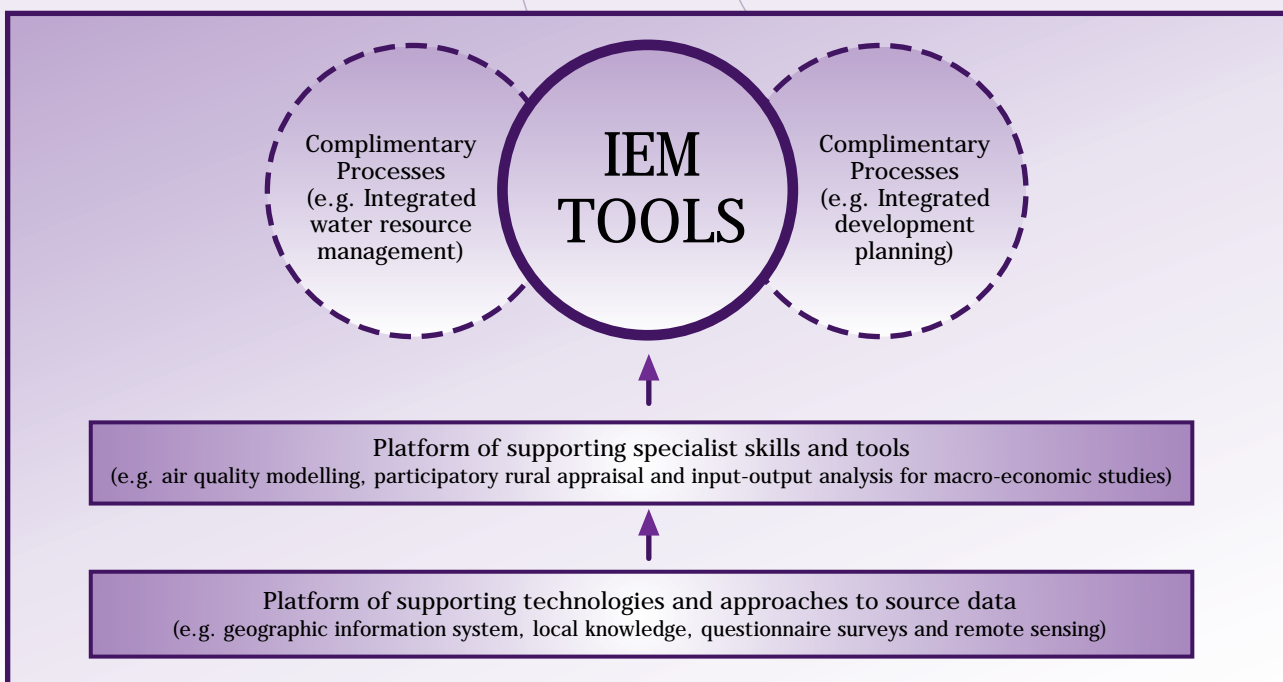


Table 2. Examples of IEM tools

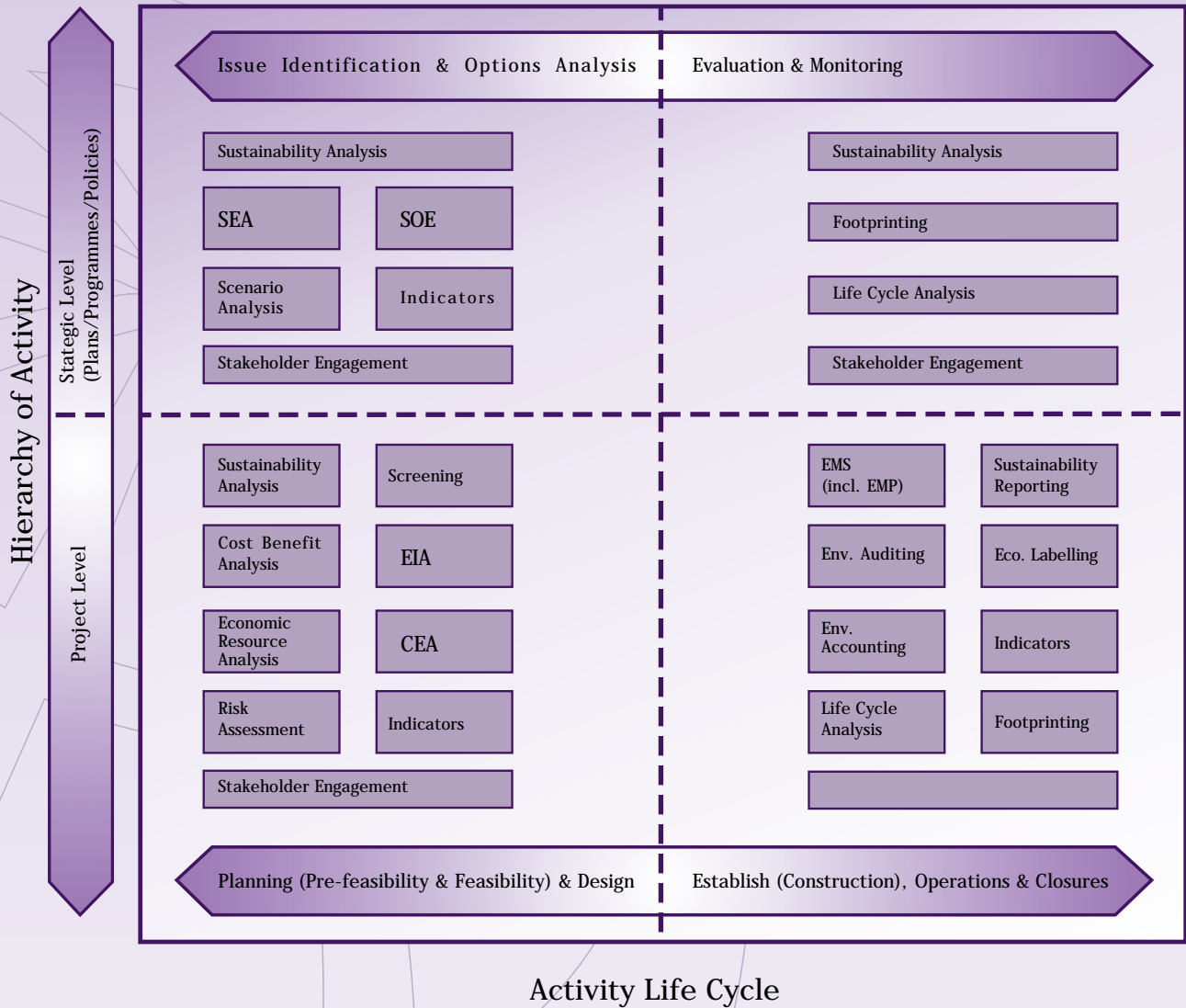
IEM TOOL	Description	Reference for more information
Screening	<p>Screening determines whether or not a development proposal requires environmental assessment, and if so, what type and level of assessment is appropriate. Two types of screening exist:</p> <ul style="list-style-type: none"> (i) Mandatory screening - typically administered by an environmental authority or some institution with vested powers to instruct that a screening process be undertaken; (ii) Pre-application screening - typically undertaken outside of a legislated process at the discretion of the development proponent, with the aim of identifying key environmental issues early in the planning process in order to inform the planning and design and often including some form of fatal flaw analysis. 	DEAT 2002, Screening, Information Series 1.
Environmental Impact Assessment	<p>Aims to predict both positive and negative environmental impacts of a proposed project and find ways to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. This tool is designed to be project specific and site-specific, and not to be focused on strategic issues. The key phases of an EIA are:</p> <ul style="list-style-type: none"> * Scoping: The process of determining the spatial and temporal boundaries, project alternatives and key issues to be addressed in an EIA. The primary purpose of scoping is to focus the environmental assessment on the key issues to be investigated in the EIA that will inform decision-making. * Impact Assessment: Involves investigation of the issues raised during the scoping phase. Potential impacts are assessed and measures to enhance the positive impacts and minimise the negative impacts are recommended. This typically involves the use of specialist studies and requires the assessment of impact significance, with the results of the assessment presented in an Environmental Impact Report. The specialist studies and Environmental Impact Report are subjected to Review processes. <p>The EIA process includes <i>stakeholder engagement</i>, which is described below.</p>	<p>DEAT 1998, Guideline Document, EIA Regulations.</p> <p>DEAT 2002, Scoping, Information Series 2.</p> <p>DEAT 2002, Specialist Studies, Information Series 4.</p> <p>DEAT 2002, Impact Significance, Information Series 5.</p> <p>DEAT 2004, Project Alternatives in EIA, Information Series 11.</p> <p>DEAT 2004, Environmental Impact Reporting, Information Series 15.</p> <p>DEAT 2004, Review in EIA, Information Series 13.</p> <p>CSIR 2003a, CSIR EIA Project Management Manual: A Practical Guide to Managing the EIA Process, Version 1.</p>
Stakeholder Engagement	<p>The process of engagement between stakeholders during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement can therefore be described by a spectrum of increasing levels of engagement in the decision-making process.</p>	DEAT 2002, Stakeholder Engagement, Information Series 3.
Life Cycle Assessment (LCA)	<p>A tool for the systematic analysis and evaluation of the environmental aspects of a product or service through all stages of its life cycle. LCA considers all inputs (e.g. energy, raw materials and water) and all outputs (e.g. products, by-products, services and various forms of waste). It could be done for a specific company/organisation (e.g. an aluminium smelter) or for a wider industry (e.g. the aluminium sector). LCA approaches are generally guided by standards. A professional code of practice has also been developed by the Society of Environmental Toxicology And Chemistry (SETAC) which provides more detail.</p>	<p>DEAT 2004, Life Cycle Assessment, Information Series 9.</p> <p>Environmental Management Tools. http://www.uneptie.org/pc/pc/tools/</p> <p>www.setac.org</p> <p>ISO 14001:1996. Environmental Management Systems.</p>

IEM TOOL	Description	Reference for more information
Environmental Auditing	<p>Environmental auditing is a process whereby an organisation's environmental performance is tested against numerous requirements, for example, clearly defined policies, legislated requirements and key performance indicators. The approach includes interviews and asking of questions; review of relevant documentation; and visual observations.</p> <p>The International Chamber of Commerce (ICC, 1991) defines environmental auditing as "A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organisation, management and equipment are performing with the aim of contributing to safeguarding the environment by: (i) facilitating management control of environmental practices; and (ii) assessing compliance with company policies, which would include meeting regulatory requirements."</p> <p>Differing types of environmental audits exist, such as: Environmental Management Audits; Environmental Compliance Audits; Waste Audits; Environmental Due Diligence Audits; and Supplier Audits.</p>	<p>DEAT 2004, Environmental Auditing, Information Series 14.</p> <p>International Chamber of Commerce (ICC) 1991, An ICC Guide to Effective Environmental Auditing.</p> <p>Environmental Management Tools http://www.uneptie.org/pc/pc/tools/</p> <p>ISO 14001:1996. Environmental Management Systems.</p>
Environmental Accounting	<p>A tool used to identify, quantify and allocate the direct and indirect environmental costs and benefits of ongoing operations.</p>	<p>Facts and Figures: www.mineralresourcesforum.org/workshops/Berlin/docs/append_4.pdf</p>
Technology Assessment	<p>Technology Assessment systematically examines the effects on society that may occur when a technology is introduced, extended or modified. It emphasizes those consequences that are unintended, indirect or delayed.</p>	<p>Petts 1999. Handbook of Environmental Impact Assessment.</p> <p>Environmental Management Tools. http://www.uneptie.org/pc/pc/tools/</p>
Cumulative Effects Assessment (CEA)	<p>Cumulative effects assessment requires a systematic procedure for identifying and evaluating the significance of effects from multiple actions representing potential causes of impacts. CEA includes an analysis of the causes, pathways (linkages) and consequences of these impacts for receptors; and the recognition that such impacts may be additive, antagonistic or synergistic. Cumulative effects assessment is not considered to be a stand-alone procedure, but should be included within other IEM tools, to further enhance holistic decision making.</p>	<p>DEAT 2004, Cumulative Effects Assessment, Information Series 7.</p> <p>Facts and Figures: www.mineralresourcesforum.org/workshops/Berlin/docs/append_4.pdf</p>
Cost-Benefit Analysis	<p>Cost-Benefit Analysis (CBA) is a tool used by decision makers either to rank projects or to accept/reject them. The ranking or decision is based on expected economic costs and benefits and the rule is simple - a project should be undertaken if lifetime expected benefits exceeds all expected costs. The art of the analysis process comes in the measurement of these impacts, their adjustment for market failure, and for the effects of time, income distribution, incomplete information and potentially irreversible consequences.</p> <p>Cost-Benefit Analysis is used at two basic levels:</p> <ul style="list-style-type: none"> * In the private sector, Financial CBA is used to justify investments, measure life cycle costs, meet regulations cost-effectively, and quantify hidden costs and intangible benefits. * Social CBA is used to appraise the social merit of projects or policies. 	<p>DEAT 2004, Cost-Benefit Analysis, Information Series 8.</p> <p>Starkey & Welford 2001, Business and Sustainable Development.</p>
Environmental Economics	<p>Environmental economics helps identify the costs and benefits (negative and positive environmental impacts) not taken into account by economic agents (i.e. external costs). In addition there are those cost and benefits the producers and consumers do take account of (i.e. private costs). In most cases, full social and environmental costs and benefits are not accounted for in market prices. In response, environmental economics presents a number of valuation techniques to internalise such, often, environmental impacts. These values facilitate a better understanding of the trade-offs between alternative economic values. The resulting environmental values can be used by decision makers to choose projects that maximize the welfare of the society.</p>	<p>DEAT 2004, Environmental Economics, Information Series 16.</p>

IEM TOOL	Description	Reference for more information
Ecological and Environmental Footprinting	<p>Ecological Footprinting provides a measure of how much bio-productive area (i.e. land, water or air) a population would require to sustainably produce all the resources it consumes and to absorb the waste it generates, using available technology.</p> <p>Environmental Footprinting is a similar concept that focuses on calculating the geographical extent of the activities, products or services of a business or organization in the surrounding environment.</p> <p>For example, footprinting could be done for an individual, an organization or a city.</p>	<p>Best Foot Forward www.bestfootforward.com</p> <p>Barrett et al 2002, A Material Flow Analysis and Ecological Footprint of York www.york.ac.uk/inst/sei/ecofootprint/york.technicalreport.PDF</p> <p>Wackernagel 1997, Ecological Footprints of Nations www.ecouncil.ac.cr/rio/focus/report/english/footprint/introduction.htm</p>
Risk Assessment	<p>Risk assessment includes as a minimum the definition of the probability and severity of an undesired effect, expressed in the context of associated uncertainties. The risk assessment procedure can be integrated with the generic EIA procedure, as well as be applied at a policy level. Other key components of risk assessment include risk management and risk communication.</p> <p>Specific applications include <i>human health risk assessment</i> and <i>ecological risk assessment</i>.</p> <p>Ecological risk assessment evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of one or more stressors.</p>	<p>DEAT 2002, Ecological Risk Assessment, Information Series 6.</p>
State of the Environment Reporting	<p>State of the Environment (SOE) reporting is used to highlight changes in the environment, the causes of those changes, and identify appropriate responses. The reports provide a link between information that is often technical and the general public.</p> <p>In South Africa, the framework most often used for organising the SOE information is called the DPSIR framework. This uses indicators to describe changes, and consists of the following:</p> <ul style="list-style-type: none"> * Driving forces - human influences and activities that, when combined with environmental conditions, underpin environmental change * Pressures - these are exerted on resources and ecosystems as a result of human activities (driving forces) * State - the condition of the environment resulting from driving forces and pressures * Impacts - the consequences or results of pressures on the current state of the environment * Responses - these are the societal actions taken collectively or individually to ease or prevent negative environmental impacts, correct environmental damage or conserve natural resources. 	<p>DEAT, South African SOE report, 1999 http://www.environment.gov.za</p> <p>Mpumalanga DACE 2003, Mpumalanga State of the Environment Report http://www.mpu.agric.za</p>
Indicators	<p>Indicators evaluate and monitor the amount and direction of change occurring in the environment and whether developments or actions are operating at a sustainable level. They are used to assess and understand the interaction between development and the environment. Most indicators are designed to provide early warning information about instability or unsustainable change in the environment. They can therefore be used in proactive planning and risk management, and are important in assessing whether goals and targets set are being met.</p>	<p>DEAT http://www.environment.gov.za</p> <p>Mpumalanga DACE 2003, Mpumalanga State of the Environment Report http://www.mpu.agric.za</p>
Sustainability Analysis	<p>Sustainability analysis is an emerging tool. It aims to evaluate the extent to which an activity/business is aligned with the principles of sustainable development and contributes to sustainable development. An example of a methodology developed for this purpose is The Natural Step. This methodology consists of three parts: ecological sustainability analysis; economical sustainability analysis; and social sustainability analysis.</p>	<p>Educating a Nation: The Natural Step. http://www.context.org/ICLIB/IC28/Robert.htm</p>

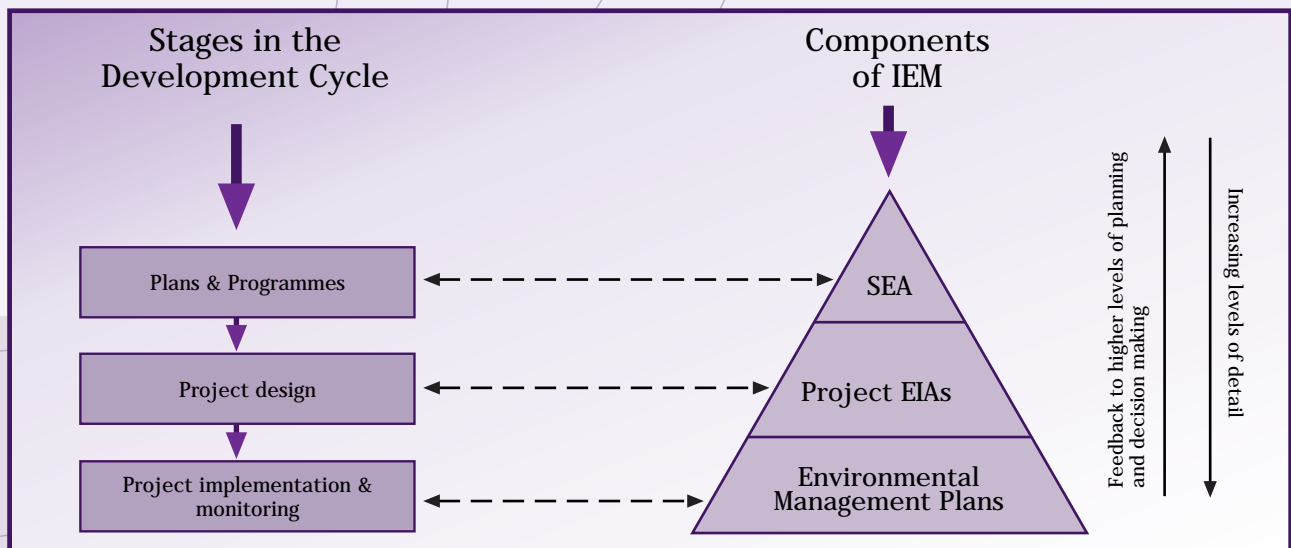
IEM TOOL	Description	Reference for more information
Strategic Environmental Assessment	<p>Strategic Environmental Assessment (SEA) is becoming an accepted and widely used tool for determining the environmental implications of decisions made at a policy, plan or programme level. By focusing on higher-level processes, SEA compliments and provides a framework for project-level EIA. Another distinction that has been identified between EIA and SEA is that EIA is used to evaluate the impacts of development on the environment, whereas SEA aims to evaluate the opportunities and constraints that the environment places on development.</p> <p>There are numerous definitions of SEA, which reflect different understandings of its purpose. These definitions tend to fall into two categories:</p> <ul style="list-style-type: none"> * Definitions of SEA that represent an extension of project-based EIA to the strategic levels of policies, plans and programmes. This approach is typically termed "EIA-based" SEA. * Definitions of SEA that focus on the role of SEA in facilitating the move to sustainability. This approach enables the proactive consideration of the objectives of sustainability and has been referred to as "sustainability-led" SEA. 	<p>DEAT 2004, Strategic Environmental Assessment, Information Series 10.</p> <p>CSIR 2003b, Strategic Environmental Assessment Resource Document: Introduction to the Process, Principles and Application of SEA.</p> <p>DEAT 2000, Guideline Document: Strategic Environmental Assessment in South Africa.</p> <p>Sadler, B. and Verheem, R. 1996, Strategic Environmental Assessment: Status, Challenges and Future Directions</p>
Eco-labelling	A term used to describe an officially sanctioned scheme in which a product may be awarded an ecological label based on an acceptable level of environmental impact and responsible management.	Facts and Figures: www.mineralresourcesforum.org/workshops/Berlin/docs/append_4.pdf
Scenario Analysis	Scenario analysis assesses the future implications of current environmental problems or the future emergence of new problems. Scenarios are credible and coherent alternative stories about how the world may develop which help us envisage different futures, that challenge our assumptions, that unpack key uncertainties, and that thereby assist us in designing more robust strategies and plans.	Van der Heijden, K., 1996, The Art of Strategic Conversation. Illbury, C. and Sunter, C., 2001, The Mind of a Fox: Scenario Planning in Action.
Sustainability Reporting	Sustainability Reporting is an organisation's public account of economic, environmental and social performance in relation to its operations, products and services - i.e. the triple bottom line.	Global Reporting Initiative: http://www.gri.com/
Environmental Management Systems (EMS)	Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products, and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for implementing and maintaining environmental management. The ISO 14001 Environmental Management Systems (EMS) standard has been developed by the International Standards Organisation (ISO).	<p>Facts and Figures: www.mineralresourcesforum.org/workshops/Berlin/docs/append_4.pdf</p> <p>ISO 14001:1996, Environmental Management Systems.</p> <p>Environmental Management Tools. http://www.uneptie.org/pc/pc/tools/</p>
Environmental Policy	Within an EMS, the environmental policy details an organisation's aims and principles of action with respect to the environment including compliance with all relevant regulatory requirements. This may form the basis for an organisation's public environmental commitment.	Facts and Figures: www.mineralresourcesforum.org/workshops/Berlin/docs/append_4.pdf
Environmental Management Plan (EMP)	EMPs typically form part of an EMS and specify how an activity is to be managed to minimise potential impacts on the environment and enhance benefits, throughout the life cycle of the activity. EMPs also aim to ensure that the conditions of authorisation associated with a project are fulfilled; and can be applied to the construction, establishment, operational or decommissioning phases of an activity.	<p>DEAT 2004, Environmental Management Plans, Information Series 12.</p> <p>Heydenrych R & Claassen P 1998, A national strategy for Integrated Environmental Management in South Africa: Discussion Document.</p>

Figure 2: Commonly used tools in the IEM toolbox



The potential hierarchical relationship between three IEM tools (i.e. SEA, EIA and EMP) and stages in the development cycle is shown in figure 3. It is not intended that SEA should replace EIA, but rather that it should complement project-level assessment, by providing an effective tool for environmental assessment at the plan and programme level. SEA can then form the context for lower levels of planning (DEAT, 2000).

Figure 3: Example of a hierarchy of selected tools in relationship to a typical development cycle



Source adapted from DEAT 2000

8. TRENDS AND CHALLENGES

As the international community grapples with finding the most effective ways to apply environmental assessment and management to meet the major challenge of our time - the challenge of promoting sustainable development - so too in a Southern African context we must identify and engage with the challenges that face IEM. The two key trends for IEM globally are:

- * The broadening focus of IEM tools to address issues of sustainable development (e.g. triple bottom line appraisal), to cover the full activity life cycle (i.e. cradle to grave assessment) and into the next phase of activity (i.e. cradle to cradle assessment), and to address “big picture” issues (e.g. biodiversity loss, global warming and poverty reduction).
- * The development of tools applicable to higher levels of decision making than the traditional project level (e.g. from EIA and EMP which are applicable to projects, to SEA and Strategic Environmental Management Plans which are applicable at the planning, programme and policy level).

Challenges facing IEM in responding to these trends and meeting its new potential include:

- * The need to improve the quality of outputs, the focus being on rigorous analysis, responsive consultation and responsible administration. This requires capacity building across all stakeholders involved in IEM, capturing and sharing of best practice experience, development of guidelines, implementation of appropriate review and accreditation mechanisms and monitoring of compliance.
- * The need to improve the level of integration between the various IEM tools for application throughout the full development life cycle. This requires, for example, attention to the integrative linkages between EIA, Cost-Benefit Analysis and SEA. There is promising evidence of progress in this direction with increasing emphasis being placed on pre-development preparation and post-establishment operational environmental management.
- * The improvement of South Africa’s ability to respond to “big picture” contextual challenges facing our nation such as poverty eradication, job creation, HIV/AIDS reduction, biodiversity loss, transboundary and cumulative effects and climate change. This will require the modification, development and institutionalisation of tools able to address issues such as cumulative effects, policy appraisal, global change and globalisation trends.
- * Effective Integrated Environmental Management requires strong co-operative government. Enabling sustainable development is beyond the realm of any single government department, transcends all levels and spheres of government, and cuts across traditional functional line departments.
- * The institutional challenge also extends to the need for effective *environmental governance* - including government, communities and business - in order to implement IEM effectively. Environmental

together to manage it’s economic, social and political resources and institutions for the well-being of the environment and the associated well-being of people (adapted from UNDP, 1997). This implies that the challenge extends not only to government, but also to non-government organisations (NGOs), business/industry, and community-based organisations (CBOs).

9. CONCLUSION

Integrated Environmental Management provides a set of underpinning principles and a suite of environmental assessment and management tools that are aimed at promoting sustainable development. Many of these tools, such as Environmental Impact Assessment, are well developed and mandatory world-wide. Other tools, such as Sustainability Analysis, are still in an emergent stage. With this suite of tools, IEM has the potential to play a major role in the imperative of guiding society along a pathway to sustainability.

Meeting the many challenges South Africa faces in achieving the goal of sustainable development requires co-operation between all spheres of government, community-based organisations, non-governmental organisations, researchers and academics, business and environmental practitioners. Constructive interactions between all of these stakeholders in the spirit of continual improvement will ensure that the country continues to play a leading role in developing and implementing innovative approaches to IEM.

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11. GLOSSARY

Definitions

Affected environment

Those parts of the socio-economic and biophysical environment impacted on by the development.

Affected public

Groups, organizations, and/or individuals who believe that an action might affect them.

Alternative proposal

A possible course of action, in place of another, that would meet the same purpose and need. Alternative proposals can refer to any of the following but are not necessarily limited thereto:

- * alternative sites for development
- * alternative projects for a particular site
- * alternative site layouts
- * alternative designs
- * alternative processes
- * alternative materials

In IEM the so-called “no-go” alternative also requires investigation.

Authorities

The national, provincial or local authorities, which have a decision-making role or interest in the proposal or activity. The term includes the lead authority as well as other authorities.

Baseline

Conditions that currently exist. Also called “existing conditions.”

Baseline information

Information derived from data which:

- * Records the existing elements and trends in the environment; and
- * Records the characteristics of a given project proposal

Decision-maker

The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.

Decision-making

The sequence of steps, actions or procedures that result in decisions, at any stage of a proposal.

Environment

The surroundings within which humans exist and that are made up of -

- i. the land, water and atmosphere of the earth;
- ii. micro-organisms, plant and animal life;
- iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the economic, cultural, historical, and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.

Environmental Assessment (EA)

The generic term for all forms of environmental assessment for projects, plans, programmes or policies. This includes methods/tools such as EIA, strategic environmental assessment, sustainability assessment and risk assessment.

Environmental consultant

Individuals or firms who act in an independent and unbiased manner to provide information for decision-making.

Environmental Impact Assessment (EIA)

A public process, which is used to identify, predict and assess the potential environmental impacts of a proposed project on the environment. The EIA is used to inform decision-making.

Fatal flaw

Any problem, issue or conflict (real or perceived) that could result in proposals being rejected or stopped.

Impact

The positive or negative effects on human well-being and/or on the environment.

Integrated Environmental Management (IEM)

A philosophy which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity - at the local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools to a particular proposal or activity. These may include environmental assessment tools (such as Strategic Environmental Assessment and Risk Assessment); environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision-support systems or advisory councils).

Interested and affected parties (I&APs)

Individuals, communities or groups, other than the proponent or the authorities, 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. These may include local communities, investors, business associations, trade unions, customers, consumers and environmental interest groups. The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Lead authority

The environmental authority at the national, provincial or local level entrusted in terms of legislation, with the responsibility for granting approval to a proposal or allocating resources and for directing or coordinating the assessment of a proposal that affects a number of authorities.

Mitigate

The implementation of practical measures to reduce adverse impacts.

Non-governmental organizations (NGOs)

Voluntary environmental, social, labour or community organisations, charities or pressure groups.

Proponent

Any individual, government department, authority, industry or association proposing an activity (e.g. project, programme or policy).

Proposal

The development of a project, plan, programme or policy. Proposals can refer to new initiatives or extensions and revisions to existing ones.

Public

Ordinary citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Role-players

The stakeholders who play a role in the environmental decision-making process. This role is determined by the level of engagement and the objectives set at the outset of the process.

Scoping

The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

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 initiated during the early stages of the development of a proposal.

Significant/significance

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic). Such judgement reflects the political reality of impact assessment in which significance is translated into public acceptability of impacts.

Stakeholders

A sub-group 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 therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (I&APs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Stakeholder engagement

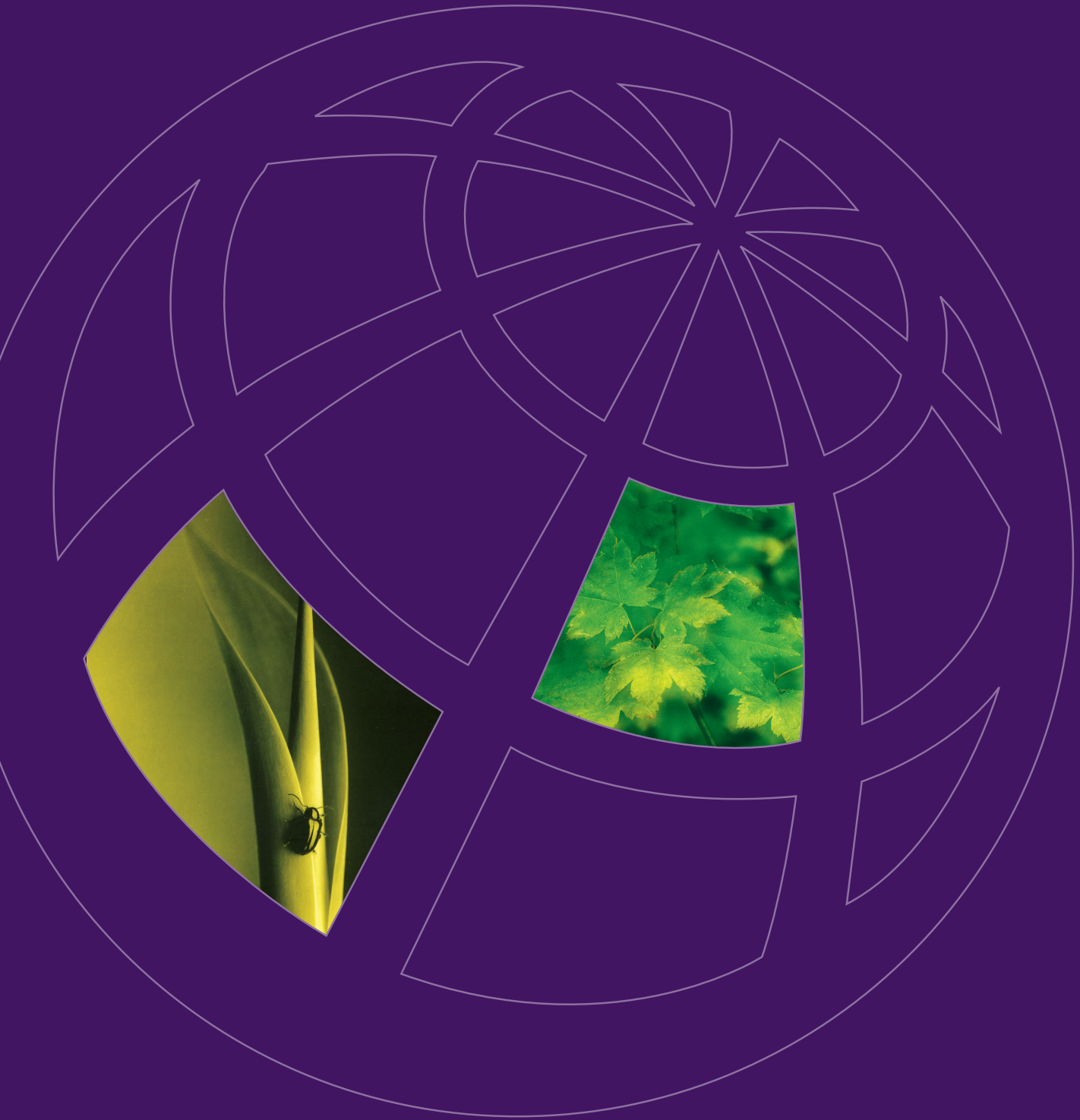
The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term "public participation".

Stakeholder engagement practitioner

Individuals or firms whose role it is to act as independent, objective facilitators, mediators, conciliators or arbitrators in the stakeholder engagement process. The principle of independence and objectivity excludes stakeholder engagement practitioners from being considered stakeholders.

ABBREVIATIONS

CBO	Community-based Organization
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management Systems
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
NGO	Non-governmental Organization
SEA	Strategic Environmental Assessment



**Department of
Environmental Affairs and Tourism**

Private Bag X447, Pretoria, 0001, South Africa, www.deat.gov.za