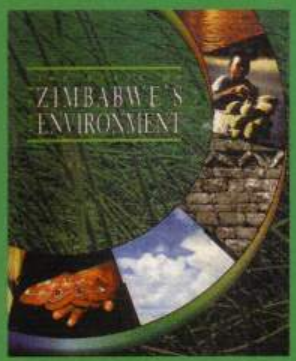
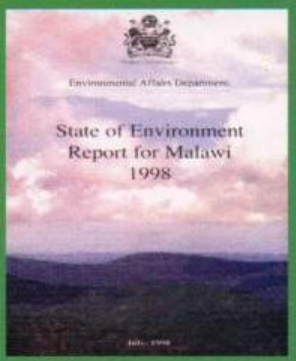
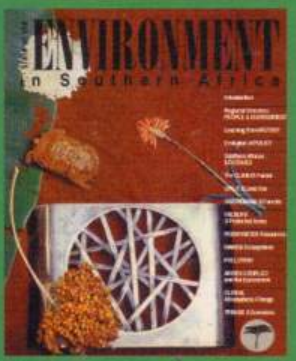
A Guide to

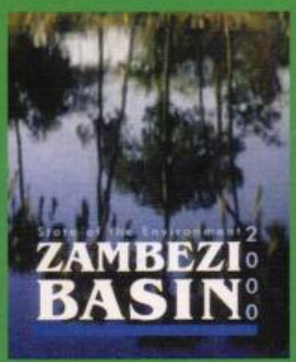
STATE OF ENVIRONMENT

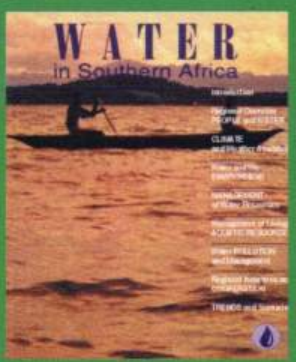
Reporting in Southern Africa

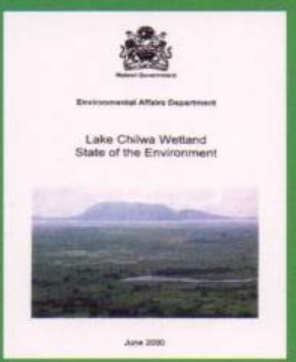


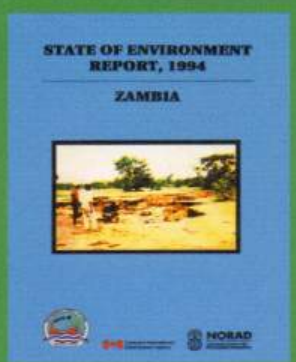


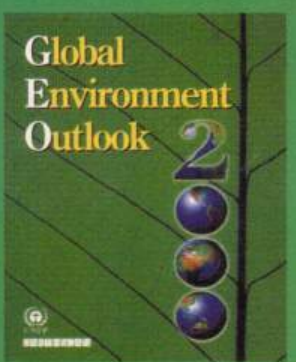


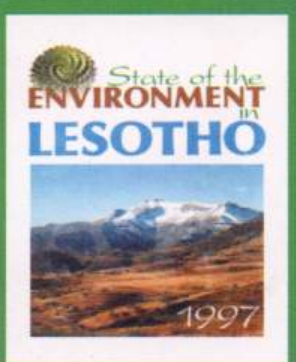












A Guide to

STATE OF ENVIRONMENT

Reporting in Southern Africa

This guide is produced as part of SARDC-IMERCSA's participation in the regional Networking and Capacity-Building Programme (NETCAB), which is managed by the World Conservation Union Regional Office for Southern Africa (IUCN-ROSA). This publication was made possible through the support provided by the United States Agency for International Development (USAID) Regional Centre for Southern Africa (RCSA), Gaborone, Botswana, under the terms of Grant no. 690-A-00-95-00950-00. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the SADC, IUCN, SARDC or USAID.

IUCN The World Conservation Union

SARDC Southern African Research and Documentation Centre

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Contents

Acronyms

CEP	Communicating the Environment Programme
CSD	Commission on Sustainable Development
DEA-T	Department of Environment Affairs and Tourism (Malawi)
DEAT	Department of Environment Affairs and Tourism (South Africa)
DNR	Department of Natural Resources (Zimbabwe)
DPSIR	Drivers-Pressures-State-Impact-Response
DRC	Democratic Republic of Congo
DRFN	Desert Research Foundation of Namibia
DWA	Department of Water Affairs (Namibia)
ECZ	Environment Council of Zambia
GEO	Global Environment Outlook
GIS	Geographical Information Systems
INTERAISE	International Environmental and Natural Resources Assessment Information Service
IR#3	Intermediate Result 3
IUCN-ROSA	The World Conservation Union-Regional Office for Southern Africa
NEAP	National Environmental Action Plan
NES	National Environment Secretariat (of Lesotho)
NETCAB	Networking and Capacity-building Programme
NGO	Non-Governmental Organisation
PSIR	Pressure-State-Impact-Response
PSR	Pressure-State-Response
SADC	Southern African Development Community
SADC-ELMS	SADC Environment and Land Management Sector
SADC-WSCU	SADC Water Sector Coordination Unit
SARDC-IMERCSA	Southern African Research and Documentation Centre Musokotwane Environment Resource Centre for Southern Africa
SOENETSA	State of the Environment Network for Southern Africa
SOEPROZ	State of the Environment Reporting Programme for the Zambezi Basin
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USA	United States of America
USAID	United States Agency for International Development
WCED	World Commission on the Environment and Development
WRI	World Resources Institute

Executive Summary

State of the Environment (SOE) reporting is a communication tool used to monitor and assess changes in the environment and provide information necessary to put in place "best practices" to manage the environment. Such reporting is critical to southern Africa where development efforts need a healthy environment.

This document has been written against a background of limited co-ordination efforts to report the environment in the region. Its prime purpose is to assist SOE practitioners in governments and research institutions with background information on the tools that can be used to improve SOE reporting.

SOE reporting dates back to the late 1960s. Its origins are linked to the introduction in 1969 of the National Environmental Policy Act (NEPA) in the United States. The 1972 UN Conference on the Human Environment in Stockholm put SOE reporting on the international agenda. Unlike North America and Europe, which quickly took the initiative to produce SOE reports, southern Africa only started to engage in SOE processes in the early 1990s in direct response to the call to present country environmental assessment reports at the 1992 Rio Earth Summit.

Countries of the region are at various stages of producing SOE reports, with some having more than one report, while others are just beginning their SOE reporting process.

This document recognizes the efforts by regional institutions involved in the Communicating the Environment Programme (CEP) – SADC-ELMS, IUCN-ROSA and SARDC-IMERCSA – in producing regional SOE reports. Efforts by SADC-ELMS to put in place policies and strategies to ensure the delivery of credible SOE reports are also recognized.

Experiences gained from national, regional and global SOE processes have enabled the identification of problems associated with methods for implementing SOE processes. In particular, a regional workshop hosted by CEP partners in 1997 identified the need to develop a regional SOE guide. This guide has been developed to initiate a process of smooth delivery of environmental information for decision-makers.

A growing trend towards environmental awareness among SADC countries and peoples, and a genuine search for solutions to the many environmental problems people face in the region drives the need to institute comprehensive SOE processes.

This guide has been specially developed with SOE practitioners in the region. Its use will be complimented with the *Guide to Indicators for State of Environment Assessment and Reporting in Southern Africa.*

This SOE guide highlights general issues in the implementation of comprehensive SOE processes. The guide can be used for national, sub-national, regional and even ecosystem SOE reporting.

The development of this guide has been a process, involving the CEP partnership and substantial inputs from national institutions of the region through their participation in the SOE network.

"... *State of the Environment in Southern Africa* is itself one example of newly formed partnerships between governments and NGOs," the former president of Botswana and then chairman of SADC, Sir Ketumile Masire said in his foreword to the first regional SOE report, published in 1994.

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- Department of Environment and Tourism (DEAT), South Africa;
- National Environment Secretariat (NES), Lesotho;
- Department of Natural Resources (DNR), Zimbabwe;
- Environment Council of Zambia (ECZ);
- Ministry of Environment and Tourism, (MET), Namibia; and
- Department of Environment Affairs and Tourism (DEA&T), Malawi.

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Introductory Overview 1

Background

The importance of environmental information as a tool for sound natural resource and environmental management was recognized in a SADC report to the 1992 Earth Summit. It noted that leaders and decision-makers in the public and private sectors need more reliable and up-to-date information on environmental conditions and trends in order to identify priorities, strengthen policies and launch new strategies and programmes to support development.

This need for environmental information was further reinforced by the 1996 SADC Policy and Strategy for Environment and Sustainable Development, which calls for an increase in public information, education and participation on environment and development issues.

The policy highlights the need for SOE reporting at the regional level, emphasizing more and better environmental monitoring and information. Under the policy's strategic priorities for action, one of the main categories identified refers to the need for "assessing environmental conditions, trends and progress made and needed for sustainable development (for example, establishing regional networks for environmental monitoring; preparing regional state of the environment reports; creating new sustainable development indicators and regional guidelines for national accounts)."

At the regional level, SOE reporting has been made possible through Communicating the Environment Programme (CEP). The aim of CEP is to bridge the environmental and natural resource management information gap in southern Africa by undertaking various environmental monitoring and assessment activities, and providing governments, policy planners, NGOs, the media and other researchers with up-to-date information on the environment.

The partnership has made significant contribution to SOE reporting with the production of four comprehensive reports: *State of the Environment in Southern Africa* (1994), *Water in Southern Africa* (1996), and *Biodiversity of Indigenous Forests and Woodlands of Southern Africa* (2000). Together with the SADC Water Sector and the Zambezi River Authority, the CEP partners also published *State of the Environment Zambezi Basin 2000*.

SARDC-IMERCSA's SOE reporting experience has assisted a number of African countries to produce their own SOE reports, including Eritrea, The Gambia, Lesotho, Malawi and Zimbabwe.

SARDC-IMERCSA also participates in the Global Environment Outlook (GEO) process, co-ordinated by the UN Environment Programme (UNEP) which brings together more than 30 collaborating centres world-wide in the production of biannual global SOE reports. Two reports have so far been published under the GEO process – Global Environment Outlook 1 (1997) and Global Environment Outlook 2000 (1999). The next edition is forthcoming in 2002.

A new initiative related to the GEO process is the Africa Environment Outlook, which is also co-ordinated by UNEP. SARDC-IMERCSA participates in the AEO process.

Rationale for SOE reporting

SOE reporting is the systematic process of timely collection, documentation and compilation of information and data on the environment. The process identifies causes and processes that condition the status of the environment, the ecological and social impacts of such conditions, and the response mechanisms that deal with identified issues.

Chapter 40 of Agenda 21, the action plan from the 1992 Earth Summit, emphasizes the importance of making decisions based on credible information. It also states that integrated management of natural resources is the key to maintaining ecosystems and the essential services they provide.

Agenda 21 makes the point that every citizen is entitled to know what is happening to the resources of their country and what is responsible for the changes. This enhances positive changes to combat environmental degradation.

Agenda 21 also facilitates acceptance of responsibility for causing environmental damage as mentioned by Qalabane Chakela in *State of the Environment in Southern Africa* (1994): "Since we have all taken part in bringing about environmental degradation, it is only fair that we all participate in measures aimed at ensuring sustainable utilisation of resources."

SOE reports help to fulfil policy and action needs with current information. They help to stimulate conservation programmes, as well as facilitate the passage of good environmental practices down through generations in the form of indigenous knowledge.

Without popular participation, environmental issues remain in the domain of government institutions and international donor agencies, thus limiting the scope of environmental management. Information is critical and SOE reports should be a tool for informing all intended target audiences.

SOE reports may be used to measure government's commitment to sustainability, and policy analysis can be used to promote environmental accountability, reflecting broad consensus on major environmental problems.

An efficient SOE reporting programme is one of the most effective ways of informing policy-makers and other stakeholders on the status of natural resources and the environment. SOE assessment and reporting, when integrated across sectors and issues, recognizes the connections and implications of natural resource management decisions.

Features of SOE reporting processes

SOE reporting provides integrated, comprehensive and timely information to support good decision-making. Such reporting programmes must be designed to meet multi-dimensional demands.

When developing SOE reporting processes, guiding principles must be established and followed. However, these principles must not be equally or rigidly applied because of the diversity of circumstances in different countries and regions.

The main guiding principles to any SOE process must include meeting the decision-making needs of users:

- close contact with SOE clients, partners and general users;
- respecting the cultural and development diversity that exists across regions;
- prioritising readers' interests; and
- recognizing environmental priorities.

Depending on available data and driven by national priorities, an SOE programme can help to identify gaps and restructure monitoring as a basis for sound decision-making. Whenever possible, the structure and contents of the process should be harmonized with international practices, making sure that products are user-friendly, concise and understandable. Conclusions must be presented in a manner that non-specialists will find easy to grasp.

SOE reports can add value over other forms of reporting if integration and interpretation of science-based data and information on a timely basis is given a comprehensive analysis across sectors and over time.

A conceptual framework to answer basic questions and make linkages between the environment and socio-economic factors must guide SOE processes. Geographical and time aspects of the environment also represent significant considerations.

Products, partners and users

The SOE reporting process should:

- produce various but timely products,
- involve a wide variety of partners, and
- be accessible to all levels of society, students, academics, parliamentarians, policy planners, media, communities, etc.

SOE reporting products, partners and users — Table: 1

PRODUCTS	PARTNERS	USERS
Workshops	Experts	Decision-makers
Comprehensive reports	Government	Parliamentarians
Fact sheets	NGOs	Researchers
Policy briefs	Community-based groups	Scholars
Newsletters	Research institutions	General public
Websites	Academic institutions	
Campaigns	Private sector	
Posters	Environmental pressure groups	

Products

Workshops bring together various stakeholders important to the process, to understand the scope and extent of environmental issues being assessed. Careful selection of participants is important to give a balanced perspective on issues to be considered, especially at the beginning. During publishing, participants can review progress and products, and suggest ways of improving the process.

SOE reporting culminates with the production of a comprehensive report. However, practitioners can focus too much on this report so that other supporting products are not given sufficient weight. While the importance of the comprehensive report cannot be overemphasised, there are limits to its usefulness arising from its size and cost. Thus, supporting materials such as briefs or pamphlets on policy issues and general facts are important. These cover specific issues, and can be directed at specific targets within manageable costs, to help in popularising the issues to a range of stakeholders such as parliamentarians and media.

In order to keep SOE processes alive, stakeholders can be updated on progress and new environmental developments through newsletters, appropriately spaced to keep keen stakeholder interest. New technologies such as Internet and email can be of great assistance in the regular dissemination of information. A website can be used to keep stakeholders informed, while communication via email can generally improve overall outputs delivery and keep the process on schedule. As was the case for South Africa, publishing the main SOE report on Internet will increasingly be the way of the future.

Partners

The main task of SOE reporting is the synthesis of information and data into a format that gives an indication of what is happening to the environment, why it is happening, and what is being done about it. Recognizing that environment is a multi-disciplinary subject, expertise is needed in various areas including:

- technical expertise for data analysis and indicators to reveal the underlying information;
- policy analysis; and
- communications to be able to convey the findings to the intended audience.

The appropriate team for producing SOE reports should be talented and dedicated, and include experts from government, the private sector, universities, NGOs, gender specialists and media. This broad scope shows the value society puts on good environmental information.

All participants should play a part in the production of SOE reports either as information providers, chapter writers or reviewers. Co-ordinating committees comprising key public and private stakeholders with knowledge of the places and issues covered by the reports play an important role. A publication and distribution team is also necessary to ensure consistency and a style appropriate for the target audiences.

SOE reporting is a consultative process involving many people coming together to share data, information and perspectives. The involvement of many stakeholders and contributors results in a more complete, balanced and credible document that a single organisation cannot otherwise produce.

The following is a discussion of the sectors that may be involved, and the rationale for their involvement:

- **Government institutions**
  Apart from the government institution mandated to carry out SOE reporting processes, other government institutions such as statistics offices, agriculture and health provide technical expertise, data and contributions on the performance of their sectors in relation to the environment. Another important role of government is that it gives the SOE process some political weight, which is important in influencing the decision-making process.

- **The corporate sector**
  Reporting on industry's impact on the environment is becoming an essential part of doing business. As southern African countries position themselves in international markets, environmental reporting will have an increasing influence on whether business or markets are secured. Business can no longer afford not to disclose environmental practices. Companies will have to adhere to international principles such as those advocated for, by the International Organization for Standardization (ISO), as well as national, regional and global protocols.

- **Research and academic institutions**
  A large number of institutions are involved in environmental research and monitoring. The expertise within these institutions has a major role to play in environmental information management in the region. Such expertise can contribute to almost every facet of information infrastructure and operation because of the diversity of knowledge that exists and the range of activities that are taking place.

- **NGOs**
  NGOs play a major role in environmental and community development by linking grassroots communities with decision-makers. In some cases NGOS have the human resource capacity and management structures to engage in SOE reporting, as they have shorter timelines.

- **The Media**
  The media acts as an information link between decision-makers, those providing information on the region's ecosystems and the public. Press conferences and field trips to critical areas of ecological importance help raise awareness on the state of the environment. Radio, television, the Internet, newspapers and periodicals are some of the important means by which SOE materials are disseminated.

Users

While SOE partners are generally a representation of the society they serve, their writing needs to be in tune with the whole society itself. If insufficient attention is paid to user needs, products can be incorrectly targeted resulting in lack of interest and even adverse feedback. The way information is disseminated to the society is an important consideration.

Client groups are diverse, often complex and may not be specific about their information requirements, especially in the planning phases of products. One of the mechanisms that could be used to overcome this complexity is to identify ways to target each group separately as follows:

- **Scientists, resource managers, academia and the research community**
  Scientists and resource managers already possess a wealth of detailed information from their own speciality, but often require data and information on subjects beyond their own field in order to study relationships and interactions. Their expectations can include datasets, and methods of analysis in addition to the results of the interpretation and assessment of environmental conditions. Other more specialised information, including technical documents discussing methodological and technical developments in environmental reporting and proceedings of consultations and workshops can be directed at these specialists.

  Ecological science is a growing field of interest in secondary schools, universities and colleges, and SOE reporting products provide an excellent source of up-to-date information on the southern African region's environment. The academic community, therefore, requires SOE materials that enrich and assist teaching environmental studies. For example, the SADC training course on Environmental Education conducted by the Regional Environmental Education Centre (REEC) in Umgeni Valley, South Africa, uses the 1994 *State of the Environment in Southern Africa* report.

  To make the results of a comprehensive assessment more useful for high school education, a teacher's kit can be produced while a derived cartoon format report and video can be useful in getting the message across to younger audiences. Urban SOE reports can use pictorial illustrations to advocate for cleaner urban environments.

  Thematic reports could be designed to assess trends and conditions for a particular environmental issue, media or ecosystem. Such reports provide more in-depth discussions on a topic than would be possible in the periodic comprehensive assessment reports. In addition, thematic reports can be used as prototypes to test new dimensions of reporting. If planned as an integrated package, thematic reports can be used as the building blocks for subsequent comprehensive assessments.

  The development of databases and maps are also valuable reporting products, usually used for research by technical people.

- **NGOs and the community**
  Authoritative information supports NGOs' efforts to influence resource planning and management. Community groups tend to want reports that are easy to understand. They do not need detailed data, but just a sense of whether environmental conditions are improving or deteriorating. Information about the interactions between human activities and ecosystems assists the public to make ecologically sound decisions as citizens, tax payers and voters.

  A summary document, poster or video could be produced for those people who require the highlights and conclusions of comprehensive assessment reports. Informative posters, fact sheets and newsletters are also useful for public consumption. However, in some cases such materials need to be translated so as to meet the requirements of minority language groups.

- **Decision- and policy-makers**
  Information on ecological conditions and trends linked to human activities, is a useful tool in the integration of ecological and economic priorities for sustainable development. Improved knowledge on how human activities affect ecosystem functions and processes stimulates decision-makers to call for a more efficient use of resources and increase the likelihood of sustaining productivity of ecosystems.

  The overriding goal of sustainable development encourages equitable distribution of resources sustained over many generations while maintaining the services and quality of the environment. In order to steer a course towards sustainable development, those who set policies and make decisions need and feedback from which adjustments can be made to speed up or slow down the impact of their interventions. They also need information about achievements or failures of their policies and decisions.

  Brief materials such as policy briefs and summaries of comprehensive SOE reports are ideal for decision- and policy-makers.

Information Requirements of Various Users — Figure 1

Source: Rump, 1996

Institutional and Legal Frameworks 2

Public institutions are always under pressure to respond to environmental pressures. However, in an ever more interconnected world the traditional pattern of decision-making, which is narrowly focused responses to what are perceived as isolated problems has itself become part of the problem.

Realistic assessment and reporting practices are essential for responding to interconnected, high-risk issues such as the environment. This realization compelled some government agencies to start preparing regular SOE reports in the 1960s. The concept of sustainable development increased the need for broad-based assessment and reporting to take into account the links among ecological, socio-economic and policy issues more systematically.

Sustainable development has evolved as a broad policy priority over the last few decades. According to its classical definition, it is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The concept is based on the recognition that the well-being of human society is closely inter-connected with the well-being of natural ecosystems.

Sustainable development brought new requirements for environmental reporting, which include:

- recognizing the links between environmental conditions and human activities;
- highlighting the need for long-term perspectives;
- considering equity both within and between generations; and
- engaging participation by all sectors of society in decision-making.

Sustainable development calls for greater emphasis on accountability, reporting and performance measurement rather than mere economic factors. The theory and practice of assessment and reporting are far from perfect in meeting these objectives. But the direction needed for change is at least known and there have been many pioneering initiatives in many countries and at many levels.

SOE reports point out environmental trends and conditions. Increasingly, these reports are becoming more integrated, covering key driving forces and policies that cause or influence the environmental state and trends, as well as highlighting policy response measures.

A clear policy and legal framework underpins a strong and successful SOE reporting process. Environmental legislation as a policy instrument may be used to further entrench the SOE process into the environmental management regime at the national, regional or global levels.

Environmental assessment and reporting are complex tasks, and will not produce the expected results unless the capacity to perform them adequately is permanently maintained. This requires that the mandates and capacities to carry out this task be considered as part of the core infrastructure for SOE reporting. Usually, this requires that the mandate be clearly expressed by laws, regulations or memoranda of understanding.

A legal framework is a public commitment that government, through one of its departments, will do SOE reports as an ongoing activity. Such a law also ensures that government allocates resources - human, financial and material - to ensure that SOE reports are produced.

In all SADC countries there is an institutional framework in place responsible for environmental management, in general, and state of the environment, in particular. Virtually all of them have national institutions (see box 2) mandated to undertake environmental assessments, monitoring and reporting. Some countries also have legal frameworks in place for the production of SOE reports.

Preface to Zambia's State of the Environment Report (1994) Box 1

The Zambian Government has recognized the need to protect, preserve and improve it's environment to enhance good management and rational use of human and natural resources for sustainable development. In 1985 the Government adopted the National Conservation Strategy (NCS) as the principal policy document guiding the most feasible ways of putting Zambia on the path towards sustainable development through the use and conservation of natural resources.

In 1990 parliament passed the Environmental Protection and Pollution Control; Act Number 12 to facilitate the formation of the Environmental Council of Zambia (ECZ) an umbrella body to coordinate environmental related activities. The Act provides for regulation of the environment through the creation of inspectorates responsible for the quality of water and air, the regulation and control of waste disposal, the distribution and use of pesticide and toxic substances, the regulation of noise pollution and ionizing radiation and natural resources conservation.

One of the main functions assigned to the ECZ by the Act is to:

"Advise on the need for, and embark upon, general educational programmes for the purpose of creating an enlightened public opinion regarding the environment and awareness of an individual and the public on their role in the protection and improvement of the environment."

Accordingly the ECZ has decided to periodically produce the state of environment reports which provide a review of environmental quality in Zambia and to indicate possible trends. Early identification of trends allows corrective action to be taken by managers of our environment and the public before deterioration has become too serious.

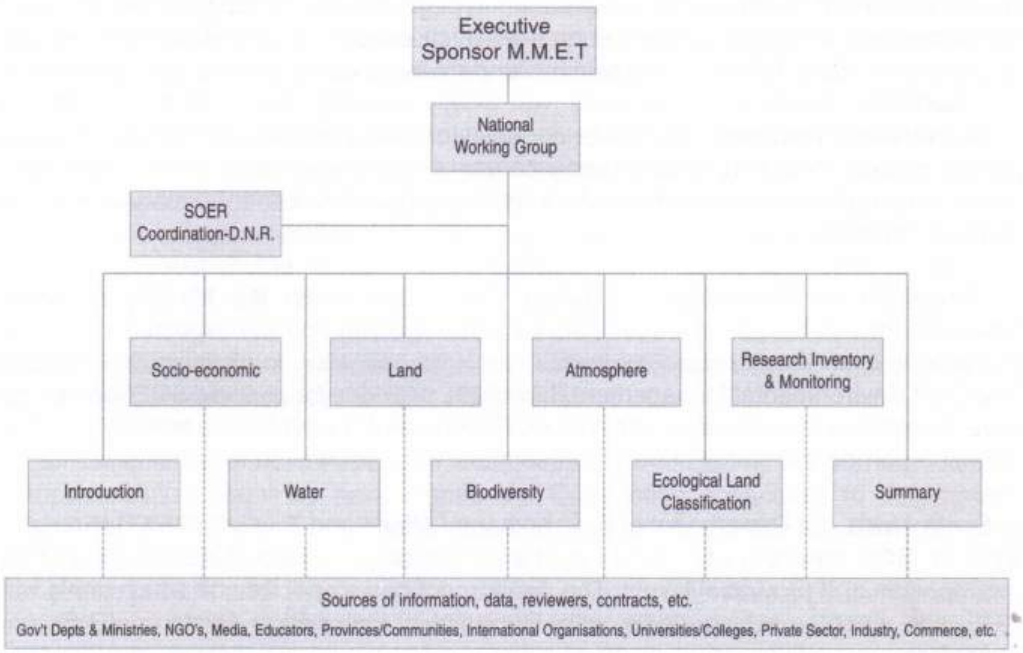
The present report has been prepared as part of the National Environmental Information Systems Programme of the ECZ funded by NORAD. In preparing this report we relied on relevant information supplied by Government line ministries, NonGovernmental Organizations (NGOs), Universities and Research Institutions.

W F Barclay
Chairman
Environmental Council of Zambia

Lusaka, June 1994

Legislation could also cover the extent of collaboration between government agencies that can contribute to the reporting initiative. The legislation could establish a special partnership among the national statistical authority, national environmental monitoring programmes and the reporting agency. Similarly, it would be appropriate for the legislation to discuss environmental reporting among various levels of government. A national reporting agency could play a catalytic and supporting role in developing reporting at sub-national and local levels. In addition, legislation could be used to encourage data-sharing and harmonization of reporting initiatives, as well as facilitate a process of consultation and participation, including the use of advisory bodies.

Organizational context for the 1998 Zimbabwe SOE Report Figure 2



The synchrony of national and regional reporting must be decided by national governments. However, there are many instances where environmental reporting is completed at the same time at both national and regional levels. Essentially national governments must contribute to reporting on environmental issues in a broad regional or continental context. This is particularly appropriate for shared issues or common ecosystems.

The benefits of providing the legal and institutional framework for SOE reporting in SADC, include the following:

- closing the existing policy gap between national, regional and global SOE processes by spelling out the institutional mechanisms as well as policy requirements for SOE reporting;
- enhancing political commitment to supporting sustainable development efforts through easy access to environmental information; and
- facilitating integrated SOE assessments by pooling together activities of the various SADC resource sectors.

Resources allocation

From the outset, SOE preparation and implementation must be considered in project management terms. Proper planning of tasks and allocation of resources is critical to the success of the reporting process. Critical resources include finance, data, human and material.

The level of budget and human resources available will determine the scope of any SOE programme. In a minimal programme, a periodic national or regional SOE report can be produced, relying on easily accessed data, limited assessment and consultation, and traditional approaches. Strategic partnerships are a way of maximizing the effectiveness of a limited budget. A wide range of products can be offered by a large programme based on more collaboration and consultation, providing integrated database support and continuous reporting using more innovative methods.

Human resources are the most expensive, but are critical. Careful planning of the allocation of staff time following a project plan is essential because the overall project duration may vary from months to years, depending upon the scope of the report.

SOE reporting laws in selected SADC countries Box 2

Not all the SADC countries have legislation in place to ensure that SOE reporting will be carried out. In Namibia, there is no law which ensures that SOE reports are produced periodically. Efforts are, however, underway to enact such a law. Meanwhile, the Namibian constitution provides for SOE reporting and this has seen the Directorate of Environmental Affairs commission many reports on various environmental issues, including natural resource use and management. In the absence of environmental law, the Constitution has helped make environmental management an issue in Namibia.

In Zimbabwe the Department of Natural Resources, under the Ministry of Mines, Environment and Tourism is responsible for SOE reporting and it is expected to carry on this activity even though currently there is no legal obligation to produce SOE reports. The Draft Environmental Management Bill (1999), provides for periodic SOE reports, but is yet to become law. However, the Natural Resources Act calls for the preparation of an annual report on the status of natural resources, for presentation to parliament.

In South Africa, the Department of Environmental Affairs and Tourism (DEAT) is responsible for SOE reporting at national level and also co-ordinating SOE reporting at the metropolitan and provincial levels. The department has a specific unit which deals with SOE and another, which deals with Geographic Information Systems (GIS) and Indicators.

South Africa's repealed Environment Management Act provided for the production of national SOE reports. However, the 1998 National Environment Management Act only provides for an institutional arrangement for environment management and is silent on SOE reporting.

In Zambia, the Environmental Council of Zambia (ECZ) is responsible for SOE assessment and reporting. The 1990 Environmental Protection and Pollution Control Act, the law that establishes the ECZ, provides for SOE reporting.

In Malawi, the Department of Environmental Affairs under the Ministry of Forestry, Fisheries and Environmental Affairs is the responsible institution for SOE reporting. The legal requirement to produce SOE reports in Malawi is mentioned under the 1996 Environment Management Act.

In Lesotho there is currently no law, which ensures that periodic SOE reports are produced. However, the National Environmental Secretariat (NES) is the responsible institution. Environmental issues are enshrined in the Lesotho Constitution, Section 36, which articulates Government's commitment to sustainable development. SOE is one of the barometers used to assess the progress made towards achieving this daunting challenge.

Source: SARDC-IMERCSA, "A Case for Improved Environmental Information Access in SADC," *SOE Policy Brief*, Vol1 No.2, 2000

Programme planning

The future direction of an SOE reporting programme is addressed by strategic planning. It provides a structured and formalized process to facilitate programme shifts to meet changing circumstances especially those of external origin. New initiatives represent an opportunity to stress more innovative approaches that are complementary to the existing efforts. The result of capacity-building across various institutions provides expanded opportunities for more effective and collaborative reporting. As the public becomes more aware of environmental issues and environment-economy interdependence, different product lines may be required to satisfy their needs.

SOE Reporting Policy at the SADC Level Box 3

The 1996 SADC Policy and Strategy for Environment and Sustainable Development highlights the need for SOE reporting at the regional level, emphasising the need for more and better environmental monitoring and information.

Under the policy's strategic priorities for action, one of the five strategic categories identified refers to the need for "assessing environmental conditions, trends and progress made and needed for sustainable development (for example, establishing regional networks for environmental monitoring; preparing regional state of the environment reports; creating new sustainable development indicators and regional guidelines for national accounts)".

Despite the lack of direct policy initiatives for SOE reporting, the SADC region produces regular SOE reports through the CEP partnership.

Establishing a legal framework for SOE reporting in SADC will not be unique. European Union countries have signed the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, which requires each signatory to, "at regular intervals not exceeding three or four years, publish and disseminate a national report on the state of the environment, including information on the quality of the environment and information on pressures on the environment."

The convention also requires each country to ensure that "environmental information progressively becomes available in electronic databases which are easily accessible to the public through public telecommunications networks." Information in this form should include state of the environment reports.

Source: SARDC-IMERCSA, "A Case for Improved Environmental Information Access in SADC," *SOE Policy Brief*, Vol1 No.2, 2000

If strategic planning is conducted in an open and participatory process, it can facilitate communication, accommodate divergent interests and values, and encourage consensus and team commitment. To ensure the SOE reporting programme stays relevant, continues to meet user needs and occupies an appropriate nichĭ within the environmental information field, strategic thinking is necessary.

A documented strategic plan provides a common point of reference to everyone involved in an SOE programme. Common elements of such a plan would include:

- an outline of the current situation;
- a mission statement focusing on the mandate and role of the programme;
- a vision of programme success; and
- specific objectives and strategies for achieving the objectives.

Generic steps in an SOE project plan Box 4

Terms of reference
Start-up meeting
Plan/table of contents
Data collection
Data processing
Writing and editing
Intermediate review
Graphical illustrations
Editing
HTML programming or page design
Review of proofs
CD-ROM or production of book (origination and printing)
Launch of the SOE products
Evaluation and updating

Source: SARDC-IMERCSA

Pertinent strategies could cover partnerships and collaboration; the range and type of products; local, regional and international data harmonisation; reporting frameworks; research needs; consultation; relationship to decision-making and dissemination of information.

Programme evaluation

Evaluation and impact monitoring should be continuous, commencing with the SOE process itself, and should adopt action-learning to be self-correcting, learning from past mistakes.

The strategic direction of an existing reporting organization can be guided by an evaluation of the total programme and of the major products. The main objective is to learn from experience. The timing of these evaluations is very important. Regular periodic evaluations are appropriate for the programme, while those directed at major projects should be completed soon after dissemination, but allowing for an initial wave of client use. The evaluation should consider both positive and negative aspects so that strengths can be reinforced and built-on in future work, while deficiencies can be addressed and improvements to products and processes incorporated as the opportunity arises.

In programme and project evaluation, it is common to assess four aspects:

- efficiency assesses the resources (time, money, and people) used in the programme or project;
- effectiveness provides a measure of the results actually achieved against the objectives that were planned or anticipated;
- relevance addresses the degree to which the results obtained correspond to the actual needs; and
- impact assesses the long-term effects of the programme in terms of broad societal objectives such as awareness raising, contribution to understanding, and usefulness for decision making.

SOE reporting and the future

SOE reporting is increasingly compelling decision makers to assess and defend their policy choices in terms of economic, social and environmental sustainability. Reporting on the environment generally improves effectiveness by making parties more accountable, diffusing information on successful strategies and methods, helping to direct assistance if needed, and providing information and assessments to guide any future developments.

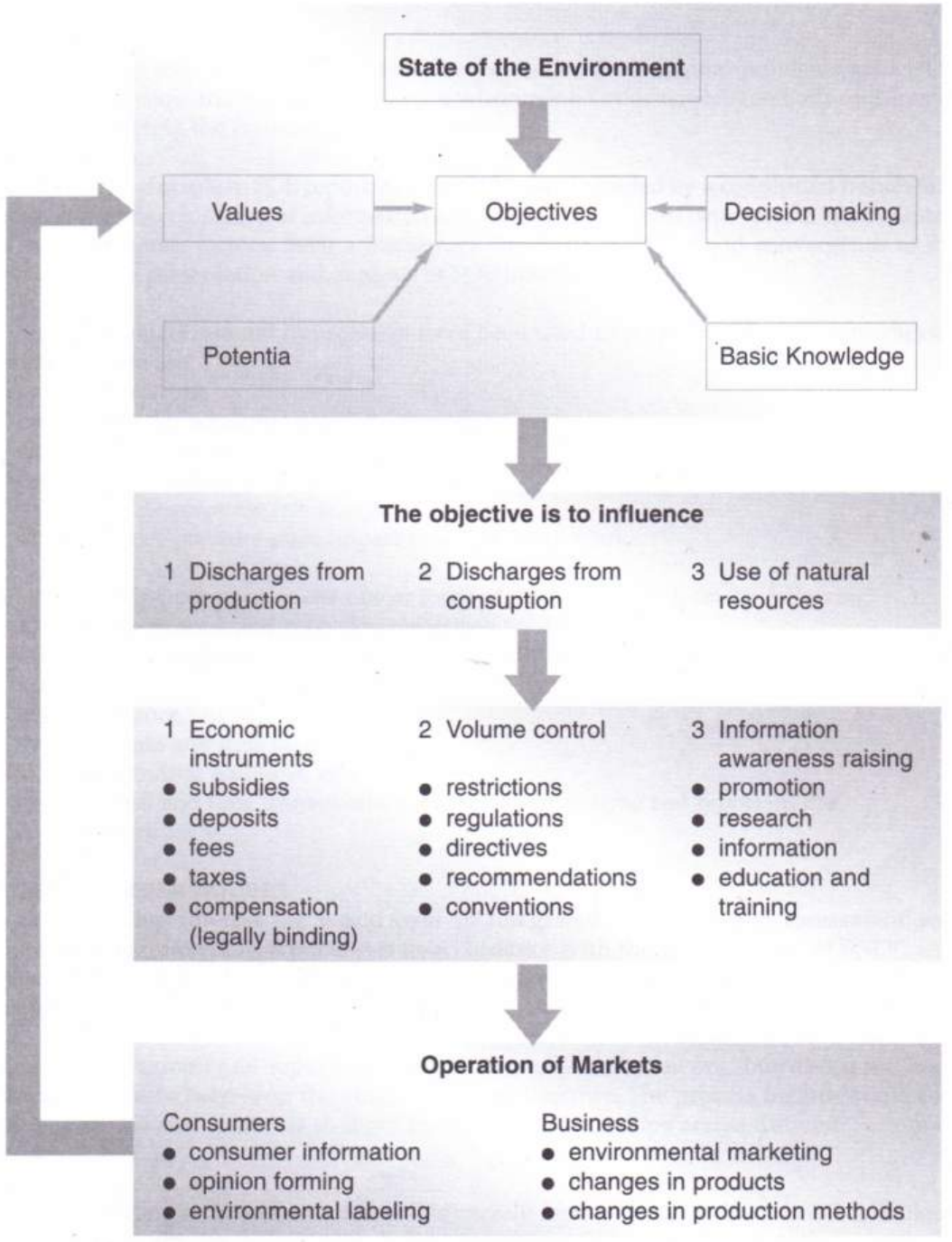
Regular SOE reporting helps to achieve equitable and sustainable development. SOE reports build into government policy and decision-making a timely mechanism for identifying and correcting remnants of unsustainable development. They also provide a regular check for assessing progress made and needed. Also, most importantly they reinforce the leadership role of governments as the pacesetters for the transition to sustainable development and rightfully earn them support of the present generation and the gratitude of future generations.

Generally, regular monitoring, assessments and public SOE reports are crucial prerequisites for better policy and decision-making. They are also cost-effective. However, data on environmental conditions and trends need to be improved, but also combined with existing economic and social data to provide a better basis for sustainable development planning and decision-making.

Scientific research has shown that communication has always played an important role in the successful implementation of environmental policies. Policy instruments work better if they are properly communicated to target groups. Figure 2 shows the policy instruments on which governments have to draw to implement environmental policy.

SOE reporting can provide early warnings of emerging environmental problems, as well as assist in identifying knowledge and information deficiencies necessary for the understanding and interpretation of environmental conditions and trends. Such programmes can contribute to the evaluation of societal response to environmental issues through policy and programme performance assessment.

Hierarchy of SOE reporting influence Figure 3



Source: Ministry of the Environment of Finland, Finnish Action for Sustainable Development, Government of Finland, 2000

SOE Frameworks

3

Given the cross-sectoral nature of environmental issues, the potential problems associated with data collection and the diverse use of environmental information, methods and frameworks for reporting the environment are critical.

An important principle in SOE reporting is that it must be guided by a conceptual framework that facilitates development of information and makes the linkages between the environment and socio-economic factors. Such a framework should bring order and convergence to the structure of the presentation and analysis of SOE information.

A number of organizational frameworks have been used to prepare SOE reports in various countries. These are:

- issues framework,
- environmental/economic sector framework,
- environmental media framework,
- environmental process framework,
- pressure-state-response framework, and
- driving forces-pressure-state-impact-response framework.

An SOE reporting process can use one or more of these depending on the following:

- scope of the process and reporting objectives,
- mandate of the agencies, organizations and institutions involved,
- user needs,
- target audience,
- available data and information,
- available funding and time, and
- geographical and time frameworks used to collect, analyse and report on the environment.

Integrated assessment

There is growing interest the world over in integrated environmental assessment and reporting. Integrated SOE reporting is in accordance with the requirements of SADC and Agenda 21 policies, which call for environmental issues to be addressed from a holistic perspective.

Integrated environmental reporting requires not only a framework, but also a methodological process to help keep the analytic process together. The process includes data collection, analysis and synthesis to show trends and relationships across different factors or issues.

Integrated SOE reporting aims at more than merely reporting on environmental conditions and trends, but also on their causes and consequences, their significance to the ecosystem, human health and the economy, and the effectiveness of policy response measures.

Integrated assessment involves answering the questions:

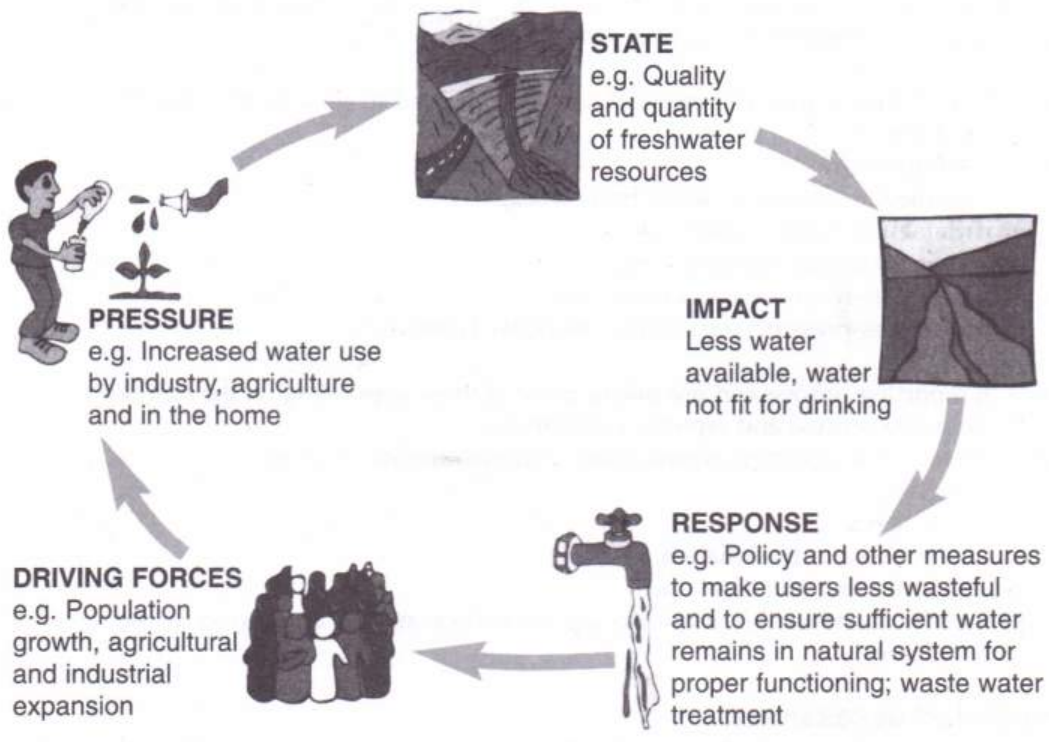
- what is happening to the environment?
- why is it happening?
- what can we do and what are we doing about it?
- what will happen if we do not act now?

As such, integrated environmental assessment is an interdisciplinary and participatory process that combines, interprets and communicates knowledge from different disciplines to allow a better understanding of complex phenomena.

The steps of an integrated assessment, include:

- combining and linking pieces of knowledge from a variety of disciplines, such as ecology, economics, geography, sociology, etc;
- interpreting viewpoints of various stakeholders such as Governments, NGOs, corporations and universities; and
- communicating knowledge to a broad audience.

DPSIR Reporting Framework — Figure 4



Data

SOE reporting presupposes the availability of strong data collection and analysis systems. Unfortunately existing data in the region is spread among many agencies that focus on one aspect or sector of the environment – wildlife, atmosphere, biodiversity, freshwater, oceans, demography and economy. As such it is difficult to integrate the datasets in order to inform how economic policies or weak policies contribute to environmental degradation and the impact that such degradation has on human and ecological wellbeing.

Quality data collected over time is necessary to quantify indicators describing environmental trends. Environmental indicators help in setting targets towards which the region states must strive to achieve their stated goal of sustainable development.

In the absence of data, SOE reporting is reduced to descriptive, anecdotal, and non-systematic observations, which do not provide guidance to decision-making. Data covering a wide spectrum of key environmental and socio-economic themes is required to support SOE reporting.

For the fact that strong datasets form the foundation for SOE reporting, data must be stored in a form that is easy to retrieve. A basic knowledge of the available data is necessary in the development of a data management system.

Ideally a database for environmental reporting must be statistical in nature, covering core issues and with a time and geographical dimension in order to show trends.

Relationship between data, indicators and issues	Box 5

Issues: are policy-level questions and problems of environmental or related socio-economic nature. Issues are controversial, subject to debate, and require interpretation. Issues can be defined in terms of (usually several) indicators, through explicit or implicit rules depending on context such as time, space, and cultural and socio-political frameworks.

Indicators: are measurable properties of the environment, defined in a time and policy context. Indicators are linked to issues through subjective interpretation and complex evaluation.

Data: are direct measurements and observations.

Linkages between data help in strengthening the data pool, as well as in identifying data gaps, which can be filled through improved surveys or remote sensing.

The progression in data quality and availability parallels the advancement of SOE reporting from description to modelling and forecasting, implying that SOE reporting can advance from a single output—a static comprehensive report – to a network of geographically referenced datasets which support the development of a continuous family of products to meet a wide spectrum of user needs.

Identifying priority themes and issues

Themes and issues for SOE reports differ depending on the geographical scope of the report. For example, coastal and marine resources cannot be discussed as a theme for a landlocked country, while greenhouse gas emissions are not an issue for southern Africa.

Key issues are those that have impacted, or have a high potential for impacting on ecosystem functioning, the sustainability of ecosystem services, human health and well-being, and the economy. These include land degradation, deforestation and water pollution. Selecting priority issues allows each theme to be articulated in a more specific manner, and allows priorities to be discussed in a more concrete way.

It is important to start by identifying the broadest range of issues possible. For each theme, enough issues should be identified to get an adequate sense of the condition of the theme. New or emerging issues should be included as well as hotspots.

Analysis must be based on reliable data and information on each issue. This entails a comprehensive search for data and information relevant to the issue. Although quantitative data are preferred, qualitative information and descriptive observations can be useful where quantitative data are lacking.

Analyses of the state of the environment and underlying pressures must take into consideration the widest possible range of social, economic, political and cultural causal agents. These include:

- demography,
- production and consumption patterns,
- poverty,
- urbanization,
- technological developments,
- governance, and
- finance and information.

Most environmental problems have multiple causes and often result from interactions all of which are not always known with certainty. Integrated assessment applied to an appropriate framework such the PSR easily makes it possible to analyse issues fully. Appropriate data is also required for tangible conclusions on the issues raised in any report.

Policy analysis

Policy responses are understood to be actions undertaken to address an environmental problem. An assessment of the effectiveness of past and present policies relevant to or specifically designed to improve the environment and the sustainability of resource use should be carried out. The purpose here is to identify and evaluate the main policy drivers, whether environmental, economic or social. Government administrative procedures are also relevant. In developing sectoral policy, for example, impacts on the environment should be considered. Policy analysis should reveal whether this is the case, and further show the results from adopted policies.

Policies may also act as a pressure on the environment. An example is subsidies on fertilizers, which encourage excessive usage, resulting in accumulation of nutrients, eutrophication and degradation of aquatic ecosystems.

Both the causes and solutions to environmental problems can lie outside the environment sector, just as environmental policies can have effects outside the traditional environmental domain. Many seemingly unrelated policies have significant potential to affect the environment adversely. Others can have unintended, yet beneficial effects on the environment. In addition to the national scale policies, systematic and widespread policies and practices of the private sector may also be relevant. In this regard a comprehensive assessment of policies of bodies such as the World Trade Organisation, the World Bank, SADC, Common Market for Southern and Eastern Africa (COMESA) or other similar groups should also be addressed according to their weight on the environment, which may be very significant.

It is important to note that several policies can be used to achieve the same aim, and specific policy responses are never used in isolation. It is up to Governments and society to choose which responses or combination of responses will best achieve policy goals. Cultural issues, policy mix and historical context of a region or country may all have an effect on how well policy works.

The complete list of policies is likely to be too long for a full analysis, but it can be reduced to a manageable length by applying selection criteria to help choose the most important policies for the evaluation. The criteria employed should relate both to the significance of the policies and environmental themes for the country or region, and to their usefulness to the policy analysis.

Criteria for selecting policies to include in the environmental policy analysis Box 6

In selecting policies for analysis in an SOE report, it is essential to note:

- relevance to identified priority environmental and sustainable development issues in the geographical scope of the assessment;
- links with key environmental and sustainable development indicators;
- effect on the health, income and well-being of people;
- relation to the country or region's international obligations; and
- potential for policy to cause disruption or conflict.

For the retrospective policy analysis priority must be given to cases where:

- policies have had a demonstrable effect on environmental problems or trends over the selected period (success stories);
- policies that clearly failed to have any effect on the targeted problem, or even had unexpected negative consequences (failure); and
- policies that are at least correlated with environmental change, even if a cause/effect mechanism cannot be demonstrated.

Source: Rump, 1996

Ideally, policy priorities based on the criteria should be identified in a consultative process. Only cases where a relationship between policy and the environment can be demonstrated should be included.

Multilateral environmental agreements and SOE reporting

When analysing the impacts of policy, a brief assessment of the impacts of multilateral environmental agreements (MEAs) that relate to the issues being addressed should be included. The assessment should focus on regional and global conventions, soft laws and environmental funding mechanisms. The impact of trade patterns and technology transfers associated with the implementation of international agreements should also be considered.

There are many global conventions and protocols that are relevant to SOE reporting. These include the Convention on Biological Diversity (CBD), Basel Convention, Convention on International Trade in Endangered Species (CITES), the Montreal Protocol on Ozone Depleting Substances, United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Convention to Combat Desertification (CCD) and the Law of the Sea may be assessed.

At the regional level, binding or non-binding agreements worth assessing include the SADC Water Protocol, SADC Trade Protocol; Protocol Concerning Protected Areas and Wild Flora and Fauna in the Eastern African Region (Africa). It must be noted, however, that only MEAs that have already entered into force should be considered.

Soft laws that are often considered in SOE reporting include Agenda 21, the Global Environment Facility (GEF), codes of conduct such as the FAO Code of Conduct on Responsible Fishing, and action plans like the Global Action Plan for the Protection of the Marine Environment from Land Based Activities. Institutions such as the World Trade Organisation (WTO) and Commission on Sustainable Development (CSD) should also be discussed.

The analysis of global conventions and protocols should focus on the measures adopted (policy responses) for implementation and effective compliance with their provisions at the national and regional level. Measures for the implementation of global conventions includes the use of economic instruments such as subsidies and taxes, tradable permits and debt for nature swaps. The analysis should cover any financing sources and mechanisms for the provision of commitments outlined in MEAs.

Emerging issues

An emerging environmental issue can be defined as an issue (positive or negative) which is not yet generally recognised but which may have significant impact on human and ecosystem health in the future.

Identifying emerging environmental issues is an important component of integrated environmental reporting. It attempts to address the following questions:

- what is happening now that might affect the environment in the long term?
- what is being done to monitor the status and urgency of this issue? and
- what is being neglected that could turn this issue into a crisis?

Some of the driving forces or causes that lead to new environmental trends and issues are natural such as fluctuations in solar activity, while others are caused by changes in the nature and scale of human activities.

It is important to identify and report on emerging environmental issues for:

- raising awareness of these issues;
- starting timely policy and management research, and data and information collection;
- increasing understanding of ecosystem dynamics and the effects of human activities; and
- promoting learning and proactive management in society.

Identifying emerging environmental issues can go a long way towards anticipating problems before they become crises, or recognizing opportunities before they are lost. The future is inherently uncertain and unpredictable, but it is very important that society consider the range of policy choices available and the range of possible outcomes associated with alternative policy paths. This is particularly important for countries or regions whose environments are rapidly changing.

The danger in forecasting, however, is the uncertainty associated with predicting the future. Given the variability of outcomes and the consequences of policy choices, thinking about and reporting on the future is like insurance. It may reduce the risk of unpleasant surprises and broaden the perception of the public and policy-makers by:

- assessing the implications of present actions, decisions and policies;
- providing early warning and guidance - detecting and avoiding problems before they occur;
- developing a proactive strategy - considering the present implications of possible future events; and
- developing normative scenarios – envisioning aspects of possible or desired futures

To a large extent future policies are understood through retrospective analysis - the past provides some of the best clues to understanding future societal and environmental interactions. Forward-looking policy analysis must be based on facts through previously identified trends and indicators. A holistic perspective helps identify policy options and consequences for decision-makers that could not otherwise be identified when analyzed in isolation.

4 Publishing and Distributing SOE Products

The production of any book or report involves the collection and analysis of relevant and adequate information and data. This analysis is then drafted into chapters. For SOE reports, professional production takes over after compilation of relevant data and information into draft chapters. The chapters are synthesized into a draft manuscript, ensuring flow of content and consistency of facts. In some cases, inter-linkages between chapters are indicated. At this point, it is advisable to have a working group responsible for the preparation of the final SOE report.

Production of a manuscript

Experts from different professional backgrounds are usually given varying responsibilities to prepare chapters for SOE reports. Such an arrangement is necessary to ensure that various views are considered and a common convergence over issues is adopted.

In order to achieve consistent and high quality products, guidelines and terms of reference for product preparation are needed for everyone involved. The guidelines should discuss the context of the programme and specific product, define the target audience, outline the storylines and main questions to be addressed, explain the writing style, outline responsibilities, provide contacts, and determine the flow and schedule of information.

The introductory section would briefly outline the purpose, mandate, experience, and range of products of the reporting process. Brief terms of reference for each group contributing to the development of the particular SOE report product would be given, stressing the linkages and communication aspects among the team members.

The target audience needs to be known and identified. SOE products need to be written for the non-specialist, with concepts and technical terms clearly explained.

Key themes, approaches, and messages to be covered by the product should be outlined. The inclusion of an annotated outline provides the starting point for the preparation of draft sections of the report, in order to ensure a logical flow from section to section and chapter to chapter. An indication of the size of the overall report would provide additional guidance to writers.

The guidelines should discuss the availability, quality control standards and use of data, as well as potential sources of data. Guidelines on official, NGO and traditional sources of data are acceptable and if writers are free to use both published and unpublished data is needed. New data add currency and extra value, but quality control and confidentiality are important considerations.

The guidelines should also provide directions on writing style to be used in order to achieve consistency for the reader. These include reference citations, bibliographic format, units of measure and technical terms, acronyms, abbreviations, spelling, and punctuation. A list of appropriate technical references to be consulted would support this. These aids to writers, editors, and reviewers could include the preferred style guide for writing, spelling and grammar, general and subject area dictionaries and references for geographic and organization names.

In addition, it is also useful to provide sample manuscript sections or illustrative components (for example, bibliography format) as models for those synthesizing chapters into the final document.

Review

SOE process co-ordinators must identify experts to review the chapters for completeness, correctness and consistency. It is usually advisable to have more than one reviewer per chapter.

The reviewer's responsibility is to ascertain that the guidelines were followed and that there is consistency in the chapters. Reviewers may also be asked to verify content of the report.

Editing

Once the chapters have been reviewed, they are ready for professional editing. The editors should be experts who, among other things, should check for consistency of facts, flow of the chapters, grammar and the style of writing, as well a querying technical words, avoiding jargon and avoiding repetition.

In addition to the written text, SOE products should normally have a balance of tables, photographs, boxed material, maps, illustrations and other graphics. These graphics help to convey information, make pages more attractive to look at and read, thereby capturing the reader's interest. Boxes can be used to provide complementary information to the overall storyline of the main text. It is the editor's role to ensure that illustrations are properly placed to match the text but the contributors and reviewers must make the illustrative material available. Some questions an editor will want to raise:

- what is the intention?
- what should be shown?
- why these data?
- what level of detail should be reached?
- what representation should be chosen? and
- what writing style should be used?

Editorial policies differ with institutions, but in all cases the underlying point of an editor is to ensure that a consistent style of writing (spellings, grammar, punctuation, referencing and end-noting) is used, and that the presented facts and figures are authentic and not conflicting. The editor also ensures that the manuscript is complete and that technical jargon is avoided or at least explained.

Publishing

SOE reports can be published in various formats, including print, electronic and video. The reports can be comprehensive or thematic, and are usually published together with supporting materials such as data compendia, fact sheets, policy briefs or posters. The reports differ in level of detail and size, and are meant to reach out to wide target audience groups.

SOE programmes are increasingly using electronic media as a channel for publishing and information dissemination. For some clients, this means that new skills related to computer use must be acquired. Client access to new technologies such as Internet may not be sufficiently developed at present in southern Africa. Nevertheless, personal computer use, improvements to telecommunications networks and access to the "information highway" are rapidly changing the way information is communicated. As it is becoming more available in southern Africa, SOE reports on the Internet are a thing of the future. Besides reaching a wide audience, Internet publishing can improve the overall cost-efficiency of SOE reporting, and will make information updating much easier.

Publishing through print involves more steps than electronic publishing, including design, which is a process of preparing the layout of the report. Page proofs must be checked carefully and any errors corrected before the report can be printed. Electronic publishing also needs design and careful checking before posting on a website.

Promotion

The report can be publicized through book launches, press statements, reviews or interviews, media kits highlighting the report's major findings and recommendations. Involvement of the media is key to the SOE reporting process. Participation in conferences, bookfairs and environmental expositions also helps in publicizing SOE materials.

Conclusion 5

SOE reporting encourages decision-makers to assess and defend their policy choices in terms of economic, social and environmental sustainability. Reporting on the environment generally improves effectiveness in environmental management by making parties more accountable, disseminating information on successful strategies and methods, helping to direct assistance if needed, and providing information and assessments to guide any future developments.

Regular SOE reporting helps to achieve equitable and sustainable development. SOE reports build into government policy and decision-making a timely mechanism for identifying and correcting remnants of unsustainable development. They also provide a regular check for assessing progress made and needed. They reinforce the leadership role of governments as the pacesetters for the transition to sustainable development and rightfully earn them support of the present generation and the gratitude of future generations.

Regular monitoring, assessments and public reports on the environment are crucial prerequisites for better policy- and decision-making.

While SOE reporting is cost-effective, data on environmental conditions and trends need to be improved. It should be combined with existing economic and social data in order to provide a better basis for sustainable development planning and decision-making.

SOE reports provide early warnings of emerging environmental problems, as well as assist in identifying knowledge and information deficiencies necessary for the understanding and interpretation of environmental conditions and trends. Such reports can contribute to the evaluation of societal responses to environmental issues through policy and programme performance assessment.

Research has shown that communication plays an important role in the successful implementation of environmental policies. Policy instruments work better if they are properly communicated.

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Appendix

1. Strengths and weakness of different frameworks

Organizational Framework	Advantages	Disadvantages
Issues Focuses on significant contemporary or emerging issues, problems and questions, which have known and potential long-term consequences. The array of issues is broad and ranges from the 'traditional" environmental issues such as air and water pollution, and soil erosion to cultural, social, and economic issues like poverty and quality of life.	• Political relevance • Timeliness • Can be applied in different spatial frameworks • Focus on issues that raise public awareness • Suitable when information availability is limited.	• Not comprehensive • Lacks ability to emphasize linkages between issues or ecosystem components
Environmental Economic Employs a classification based on human activities e.g. agriculture, forestry, fisheries, mining, tourism, manufacturing, energy and transportation. The method takes advantage of established infrastructure and the supporting data management systems in place. It also provides information on the benefits and products derived from the environment and the economic consequences of environmental trends.	• Human use of natural resources emphasized • Data normally readily available	• Lacks ábility to recognize ecosystem complexity or processes
Environmental Media This is thematic approach, which represents the traditional method of reporting on the SOE. It often reflects the common divisions of the environment into components- atmosphere, land, water, and biodiversity- and also the structure of the environmental inventory and monitoring programmes, legislative mandates and national goals.	• Political relevance • Identifies trends in environmental quality • Ability to complete a com prehensive analysis within each environmental component. • Timeliness • Data normally available	• Lacks ability to analyze effects or linkages in ecosystems. • Difficult to apply approach within an ecological framework
Environmental Process This approach is based on the assessment of the impact of human activities on the physical and biological processes of ecosystems, (composition, structure, and function) such as the circulation bio-accumulation of contaminants, alteration in community structure and instability of systems. This approach provides a systematic and comprehensive coverage, which cuts across all the sectors in an integrative manner.	• Encompasses elements of the other less comprehensive frameworks. • Facilitates development and evaluation of integrated policy responses to environmental problems. • Illustrates cause-effect associations	• Requires data that identifies and confirms cause-and effect relationships. • Requires data generated from long-term monitoring programmes, which may not be readily available. • More complex to use
Pressure-State-Response The PSR framework virtually incorporates all the other frameworks and is more comprehensive in its application. The pressure-state-response model, which allows SOE reporting to organize and select the themes that best, suits the jurisdiction for which the report is being prepared. This model recognizes that human activities exert pressures on the environment. Society then responds with policies and programmes to prevent, mitigate or repair the environmental damage.	• Incorporates virtually all elements of the other frameworks. • Ensures the integration of various sectors, stakeholders and expertise. • Takes into account both ecological and social environment. • Facilitates development and evaluation of integrated policy responses to environmental problems. • Illustrates cause-effect associations.	• Data still collected along sectoral and administrative interests. • Poor integration of envinmental and socio-economic processes, reflecting their interconnectedness • More complex to use

Organizational Framework	Advantages	Disadvantages
Driving Forces-Pressure-State-Impact and Response (DPSIR) The DPSIR framework incorporates all the frameworks which can be used for SOE reporting. This framework takes into account the driving forces, which are the underlying human activities, which exert pressure on the environment with adverse effects.	• Incorporates all the elements of the other frameworks • Takes into account driving forces and impacts on the environment. • It is holistic. It takes into account the biophysical and socio environment. • Facilitates development and evaluation of integrated policy responses to environmental problems. • Illustrates cause-effect associations.	• Like the P-S-R model, data is collected along sectoral and administrative interests. • Is is a complex framework to use. • Not all the parameters fit, thus it is difficult to integrate environmental and social economic process.
Spatial Framework	**Advantages**	**Disadvantages**
Jurisdiction/Administrative Thematic (Sectoral) This refers to political or administrative boundaries, for example, global, regional, sub-regional, national, provincial or local.	• Familiar boundaries easy to relate to • Common unit for data collection, especially socioeconomic • Data presented in an environmental perspective	• Neglects natural boundaries • Lacks ability to highlight ecosystem linkages
Environmental Component This represents a compromise between the organization of available data and the need to interpret a complex environment, for example, species, protected areas, soil types, topography, and climate.	• Takes advantage of data from natural resources agencies. • Can lead to a large number of unit boundaries	• Lacks ability to provide a comparison between various environmental components
Ecosystem/Ecological This uses geographic units, which contain distinctive sets of abiotic and biotic features that are ecologically interrelated, for example, small and large ecosystems.	• Integrates environmental and socioeconomic data • Shows linkages between and within ecosystems • Environmental reporting consistent based on common units	• Ecosystems not always defined • Generally data is not well organized ecosystem boundaries

SOURCE: Adapted from Rump P.C., State of the Environment Reporting: Source Book of Methods and Approaches, UNEP/DEIA, 1996

2. Institutions mandated to undertake SOE reporting

Country	Institution
Angola	Ministry of Environment
Botswana	National Conservation Strategy Coordination Agency
Lesotho	National Environmental Secretariat
Malawi	Department of Environmental Affairs
Mauritius	Department of Environment
Mozambique	Ministry for the Coordination of Environmental Affairs
Namibia	Directorate of Environmental Affairs (DEA)
Swaziland	Swaziland Environment Authority
South Africa	Department of Environmental Affairs and Tourism
Tanzania	National Environment Management Council
Zambia	Environmental Council of Zambia
Zimbabwe	Department of Natural resources

Source: SARDC-IMERCSA

3. COUNTRY CASES

Angola

Angola is still to produce its first SOE report, partly because of the civil war that has ravaged the country since 1975. Environmental information about the country is available from other sources such as UN country profiles, external research papers and other national case studies. The analysis presented below was based on the Environment Status Quo Assessment Report done in 1992 by IUCN ROSA and funded by the European Union.

The report has been subdivided into five chapters and a series of detailed annexes for reference purposes. Chapters 1 and 2 provide an overview of the socio-economic and political context for environmental action in Angola. Chapter 3 reviews the key ecological determinants of biodiversity in Angola while Chapter 4 analyzes the key issues and problems and provides recommendations for specific priority actions. Chapter 5 charts out a framework for environmental action with strategy and programme proposals.

The report elaborates the information on population figures by including a map that shows distribution within Angola. The figures provided are estimates based on the last population census conducted in 1970 by the Portuguese colonizers. The data values are subject to error, as they do not account for the impacts of the war on population distribution.

Satellite imagery was used to rapidly assess the status of major utilizable natural forests. Graphs, maps and tables were used to present data on climatic conditions in Angola. The report targeted policy-makers and academics in search of information but the language was too technical for the average user. The diagrams are detailed throughout in black and white.

The report noted the main issues expected to cause a sharp decline in the state of the environment and went on to give recommendations to reduce impacts. It discussed the urban environment, threats to biodiversity and wildlife, protected areas and also wood and forestry. A list of the protected areas was given and considerable detail on forestry including policies on forestry, human resource development, and management of priority issues.

In conclusion the report discusses the way forward towards sustainable development in the face of the current exploitation. It also highlights the opportunities and constraints the country is facing.

The assessment has not been published formally, meaning that an SOE report for the country is urgently needed.

Botswana

Botswana is in the process of preparing their first ever SOE report.

Democratic Republic of Congo

DRC still has to prepare an SOE report

Lesotho

Lesotho is home to the SADC Environment and Land Management Sector (ELMS) which is mandated to produce SOE reports at the regional level. The first regional SOE report produced and endorsed by ELMS was *State of the Environment in Southern Africa* done in partnership with IUCN and SARDC in 1994. Lesotho published its first national SOE report in June 1999. As a country totally surrounded by South Africa and also because of its unique topography and mountain ecosystems, it was necessary to include it in the SOE country visits which identified the following issues as unique to Lesotho:

- little information flow within SOE reporting practitioners as well as out of the SOE secretariat to the public;
- insufficient in-house capacity to deal with SOE reporting needs to the extent that the two SOE practitioners were mainly responsible for administrative issues regarding the process and external consultants had to produce the report; and
- indicators for SOE reporting were developed with the help of external expertise and the databases developed were not fully utilized or updated.

By most standards the first and only SOE report for Lesotho published in 1999 is a well-structured and professionally presented publication. The report has an executive summary, and an introduction that summarizes all the topics covered in the 16 chapters. There is emphasis in the first two chapters on economic and human development. The main issues covered are environmental integrity, health and human well-being and resource sustainability.

The report uses 1980 as the baseline in analyzing inflation by per capita income and graphs and tables with data highlighted by colour were used to give a picture of the trends. At the end of the chapter the pressures and effects imposed on the environment by economic activities are highlighted. Health issues were addressed and statistics for disease prevalence are relatively recent. Photographs are also used. The pressure state response model was used in a relatively effective manner.

Chapter 3 covers cultural and historical heritage issues. It also contains pictures and identifies the main threats to cultural and historical heritage, which include modernization and urbanization. Photographs of monuments and rock paintings were used effectively. What could be interesting to note is that this chapter serves well as an introduction to the preceding two, and hence a misplacement.

The chapter on agriculture (chapter 4) focuses on the nature of farming systems, soil management and the quality of the productive land base. Graphs, tables, photographs, with colour contrasts are used. Databases of land use and farming systems include quantified changes in arable land, encroachment of by residential and industrial demands, landlessness and the use of agrochemicals. However, there are gaps in some of the data sets. For example, the graph showing cereal yields lacks data for the year 1991-1996. The important indicators of pressures on the environment identified were population density and landlessness.

In the rangeland and livestock chapter (Chapter 5) a detailed description of the vegetated areas of the country, rangeland conditions, livestock population management and legislation is included. Charts, tables and photographs are used, although data is lacking for more recent years especially after 1993. This is a principal problem because the report fails to give the state of rangelands and livestock as at the time of writing.

Chapter 6 on indigenous forests, trees, shrubs and afforestation highlights policies and legislation dealing with some natural resources issues such as forests. Illustrations and maps are used to show the distribution of natural resources. However, there is general absence of cartography in most of the report.

Mining problems are addressed in Chapter 7 but the quantitative data is insufficient to the magnitude of the effects of mining. A map is also used in this chapter.

Chapter 8 and 9 cover roads, land use planning and soil conservation respectively and a number of aids were used such as maps, tables and photographs. Environmental implications and problems related to land were dealt with in a detailed manner.

Climate and climatic change was well covered in chapter 10 with clear statistics given although the language used is too scientific and technical. Graphs and maps were used effectively.

Water and water resources (chapter 11) is well laid out with maps and tables showing distribution and levels of precipitation in Lesotho. Water pollution is not adequately addressed.

In chapter 12 on biodiversity and protected areas are covered and statistics given but the language is too scientific.

Chapters 13 and 14 deal with energy resources, energy use and the urban environment. Both chapters are linked and cover many common issues especially air and water pollution. Data is lacking, however on pollution and the type of waste products, although most of the environmental hazards and sources are identified.

Chapter 15 deals with environmental policies, legislation and institutional arrangements and covers the history and changes in the environmental laws over the years. Photographs and tables are used and problems identified include quality of environmental legislation and implementation of environmental laws.

The final chapter focuses on environmental trends and scenarios and summarizes the main trends in the variables used as indicators of the State Of the Environment in Lesotho. The chapter acknowledges the data problem, because data is either lacking, in different units, or covering differing time periods. As a result, it was difficult to reach meaningful trends and scenarios.

The following problem conclusions can be reached about the Lesotho SOE report:

- although the writers suggest having used the pressure state response methodology, its application in the report is not obvious;
- it is generally difficult to follow an issue from its origin, current states to any policy measures in place;
- writing style differs from chapter to chapter and there are gaps in some data sets;
- presentation of basic facts is not consistent in the report so that some chapters rely on cartography, some on statistical graphics and others on mere tables of raw data and
- no mention of the indicators used in producing the report.

Malawi

Malawi has the responsibility of developing the inland fisheries and forestry sectors of the SADC region. As a country largely dependent on fishing and agriculture, its SOE reporting problems are similar to those in other parts of the region. Malawi has also started to take bold steps to introduce SOE reporting at the district level, becoming the first country to do so. During the process that resulted in the 1998 report, a comprehensive database on environmental indicators was also created, another first. Both ideas could benefit the rest of the region.

The 1998 SOE report for Malawi, was its first and was prepared by the environmental affairs department. The major objectives included giving the general public and decision-makers information concerning the state of the environment, and to seek their support in addressing these problems.

It also:

- provides information on the government's progress in addressing environmental problems stipulated in the National Environmental Action Plan (NEAP) adopted in December 1994;
- monitors the impact of international environmental conventions and treaties; and
- develops a baseline for key environmental indicators against which changes in the state of natural resources can be monitored.

The report was produced for the general public and government officials who make policies and decisions on issues of the environment. In compiling the SOE report emphasis has been on identifying key environment indicators for each of the problems identified by NEAP and in compiling information on trends for selected indicators to facilitate the monitoring process.

The indicators identified include:

- pressures on the state of the environment that emanate from socio-economic, political and institutional shortcomings and state indicators;
- the bio-physical condition of the specific natural resource sectors; and
- responses to problems and reactions to the unwanted trends in the pressure and state indicators which aim to reverse the changes. This tallies with applying the pressure state response methodology.

The report lacks more recent data which limited the analysis. It spells out the deterioration of the country's natural resources and the environment as a great concern to the nation.

Soil and land degradation was more pronounced in densely populated and heavily cultivated areas, and the suggested solution was an improved cropping system which incorporates complete physical conservation and land use set out in accordance with land husbandry recommendations.

Forestry, fisheries and water resources have been declining due to demand by the increasing population,

inappropriate discharge of industrial waste and exploitation by artisan fishermen.

The report was written only in English, in book form and, at the time of publishing, a disk and Internet version were planned. The department discussed a number of policies on each sector and devoted considerable time to analyzing collected data into usable indicators.

The 113 page SOE report was produced by a well balanced team, and effort was made to follow the pressure response methodology. The general conclusions observed include:

- GIS techniques have been applied in presenting spatial data, although their sources seem to be external to Malawi, and hence no capacity exists within the department of environmental affairs to implement the similar techniques in the next report;
- there is apparently no linkage to non-national SOE reporting in the national report, an issue also raised during the country visits; and
- some chapters are rather short, without enough deliberation on the issues they cover.

Mauritius

Mauritius, like Seychelles, is classified under the small island states where state of the environment reporting is particularly important to update information on global warming and climate change that has an adverse effect due on rising sea levels. The report assessed was the SOE report presented at the Earth summit in Rio de Janeiro in 1992. The report was compiled by a team drawn from various government ministries, and did not follow any formal methodology.

The report is quite detailed, was born out of the National Environmental Action Plan (NEAP) and the Environmental Conservation Strategy, and presents the Mauritian environments in a rather technical language.

There is fair use of indicators, presentation tools, maps and pictures which make the report very professional. An index at the end could have made it even more user friendly. While ample data and analysis was presented, the approach used (sectoral) makes it difficult to follow an issue through.

Mozambique

Mozambique still has to produce its first SOE report, and the analysis presented here is based on a country environmental profile prepared for the African Development Bank. It is important that the country start to implement SOE processes since even this country environmental profile from 1995 already needs updating.

An overview of the state of the environment is given as an extract from the profile which was developed as a reference for most important environmental issues facing the country The report is designed not only to be the environmental base for the bank, but also to support bank staff and regional member country officials by providing updated environmental background information.

The report did not specify the organizational structure that was used. However a number of environmental problems were reported according to sectors. These include water resources degradation, soil erosion and land degradation, urbanization, forest degradation and loss of biodiversity and energy related environmental problems. The report did not concentrate on rural areas but on urban areas and the influence of industrial activities on the environment.

Due to the poor institutional infrastructure, ill-defined responsibility and accountability and lack of trained expertise, little in terms of environmental protection or sustainable development has been achieved in the country, the report notes.

It is important that the country embarks on a process to update information on its current state of the environment.

Namibia

In Namibia state of the environment reporting is relatively new. The country has, since early 1999 produced the first set of sectoral reports covering water and socio-economic and industrialization. Four more sectoral reports were scheduled by the year 2000. Namibia is one of the few countries that has produced sectoral reports, that is why a country visit was carried out as part of this assessment. This is unique in the sense that other countries produced detailed National SOE reports covering nearly all the sectors and themes.

The sectoral SOE report on water in Namibia is presented as two volumes:

- Volume 1 - an executive summary followed by an introduction to indicators and a tabulation of each of the key indicators identified in the technical report; and
- Volume 2 - The technical report in which the water environment is described and indicators defined for the state of the water environment.

The chapters have a similar structure with an introduction, subheadings, an overview of the existing information and a final section analyzing the situation in Namibia and suggesting ways to monitor change in the state of the environment.

In volume 1, the chapters are not highlighted or numbered, with no chapter breaks but there are subtopics with a continuous flow from one subheading to the other. There are few maps, tables but no coloured pictures.

Volume 2 is the technical report, which is made up of eight chapters in which the water environment is described in great detail and indicators identified.

Chapter 1 gives an overview of some environmental issues related to water and it's sustainability in Namibia. The physical and climatic determinants (Chapter 2) contains maps, tables, charts, pictures, graphs and data on precipitation collected by a number of organizations, including Namibia Meteorological Services (NMS), hydrology division in the department of water affairs (DWA), and the Desert Research Foundation of Namibia (DRFN). However, the language used is scientific and technical and would not appeal to a wide range of readers.

Chapters 3 and 4 cover surface and ground water issues. The two chapters are interlinked on pollution. Detailed maps, tables, and pie charts are used effectively and most of the data was derived from the DWA.

In Chapter 5 water supply and demand is dealt with in great detail with the use of reading aids such as tables,

pie charts and pictures. The data used was collected from studies done by ministries, government departments, consultants and other institutes. Some data projections for the years beyond 2000 using the key indicators are given.

Chapter 6 deals with institutional responsibilities, roles, and mandates for management of the water sector. Data and information was mainly from surveys and case studies carried out by government departments, organizations, ministries and the National Archives of Namibia.

In the Legislative Framework, Policies and Regulations (chapter 7), the laws, regulations and acts pertaining to the water sector, water resources and its conservation are covered. Fewer tables are used to assess and evaluate the water situation in Namibia. Identification of key and potential indicators of appropriate legislation, policies, and regulations is given.

The final chapter focuses on the sharing of water resources of Namibia with neighbouring countries. A number of rivers such as the Zambezi, Okavango and Orange are mentioned. A few tables are used but the chapter generally lacks maps, and figures that could have improved the layout and presentation.

Namibia adopted a different approach to SOE reporting than elsewhere in the region. Substantial information is presented in the sector reports to guarantee the user sufficient data relating to the issue of interest. The following areas need attention, however:

- the chapters are generally very long and could have appealed to a wider audience if colour, illustrations, graphs, photographs and less scientific language had been used;
- the reports take the form of a master plan and in some areas contain technical detail that could prevent non-technical users from effectively becoming involved;
- although the issue of indicators is discussed and a wide variety given, the methodology used to present them is hazy, and makes it difficult to follow through an issue;
- given the size of the sectoral reports produced so far, the final report consisting of all sectors will be very large and unusable for those seeking to get an overview of the state of the environment; and
- the reports were not professionally published. They, however, present enough base materials for writing the national SOE report.

Seychelles

No reports were available for assessment.

South Africa

South Africa is the only country in the region carrying out SOE reporting at the sub-national level. South Africa is currently implementing a project known as cities environmental reporting on internet (CEROI). The project is being carried out in four major cities, Pretoria, Johannesburg, Cape Town and Durban.

Ideally provincial and sub-sector SOE reports would feed into the national report, a situation absent in the rest of the region, where reporting is only carried out at the national level. Another interesting feature of the SOE process in South Africa is the web-based approach, which is also absent elsewhere in the region. Many lessons for those countries interested in venturing into the sub-national reporting processes and using advanced information technology can be learned from this approach. South Africa is one of the few African countries that have strong institutional arrangements to produce SOE reports periodically, although most reports have been produced with external funding.

The analysis is based on the *State of the Environment South Africa 1999 - An Overview*, and the online version at www.ngo.grida.no/soesa/. The report is divided into two main sections — one on the physical and the other on human environments.

Under Physical Environment there are four chapters:

- climatic and atmospheric change;
- sustainability of terrestrial ecosystems;
- sustainability of freshwater resources; and
- sustainability of marine and coastal systems.

And in the second section topics covered are:

- social;
- economic; and
- political environments.

All chapters are divided into the same subsections with an overview of the chapter at the beginning, followed by introduction, driving forces, pressure, state, impact, responses, outcome, linkages (with other chapters), data issues, conclusions, references, indicators and links. The DPSIR reporting system was appropriately used, which describes environmental issues in terms of the following categories: driving forces, ressures, state, impacts, and responses.

Generally, the language level requires someone to have at least high school education for it to be effective. Graphs, colour photographs, charts, tables and maps are used effectively in all chapters. However, some data sets have gaps or are based on outdated information. The chapter topics are generally well-linked and highlighted in all the chapters.

The first chapter on the Physical Environment section is Climatic and Environmental change which points out their causes due to such pressures as volatile organic carbon emissions, greenhouse gases etc. Sources and amounts of air pollutants emitted are highlighted but the statistics are not recent. Flowcharts, tables, and colour photographs are used effectively.

The Sustainability of Terrestrial Ecosystems chapter focuses on a number of issues related to terrestrial environments, which includes pressures such as population growth, industrialization, urbanization, intensive agriculture and forestry. Colour photographs, pictures, tables and charts are used but data was mostly qualitative, geographically limited and at times outdated. There was no data on acidification, salinity and on pollution levels.

The chapter on the Sustainability of Freshwater Systems generally contains good quality data on water quality and hydrogeology though it has a few gaps. The main source of the data was Hydrological Information Systems. The Sustainability of Marine and Coastal Systems chapter deals with the pressures such as population growth and urbanization that are responsible for the negative changes occurring in this particular environment. Shipping, oil spills and wastes from vessels are identified as making marine water less suitable for marine life and human use. Colour photographs, pictures, tables, and graphs are used as reading aids.

The Social, Economic and Political Environment section discusses the effects and pressures imposed on the environment especially by population growth, policy-making, and economic growth. These chapters are closely linked and cartoons, colour photographs, tables and graphs are used extensively in this chapter. International conventions, policies and legislation dealing with the environment in South Africa are listed with definitions being given to assist the reader in understanding topics regarding policies and the legal framework.

In addition there are two sections at the end, which focus on the causes of environmental change, and the responses to environmental change in policy- making, formulating programmes and strategies.

The South African experience did not only endeavour to follow the DPSIR method by the book, but also went further to publish it online. The effort put to produce the quality report is commendable, and the following general conclusions can be drawn:

- South Africa has the leading internet connectivity in the continent as a whole, but the level of connectivity especially among average citizens is not high enough to make internet the most effective tool for disseminating the report as yet;
- the overview report is too highly summarized to make it a substitute for the full internet version, raising the need for a fuller hard copy version of the internet report; and
- extrapolating to the region, where internet connectivity is low, the method can only be used as a complement to hard copy products.

Swaziland

Swaziland has an in-house SOE report produced in 1985 with assistance from UNEP.

Tanzania

No SOE reports were obtained for Tanzania.

Zambia

Zambia was among the first countries in the region to produce a national SOE report in 1994. The environment in the country is faced with many threats ranging from pollution and runoff associated with mining and industry, flooding, flood plain cultivation, shared resources, to those associated with conservation of biota.

An interesting experience in Zambia from which the region could learn is associated with funding for SOE reporting. While the 1994 report was entirely funded from external resources, the 1999 report will enjoy only 60 percent external funds. The countries of the region would copy this example as one possible way of ensuring sustainability of their SOE reporting requirements.

The 1994 SOE report is consists of 14 chapters covering a wide range of topics. The chapters are generally brief and not too detailed compared with the Lesotho and the Namibian sectoral reports. Because of the language used, people with at least high school education should be able to understand or use it effectively. Various reading aids such as colourful photographs, maps and tables were used effectively to make it more user friendly.

The first chapter gives a general picture of Zambia with geographical and geophysical facts on the country's location, climate, surface area, rainfall, land utilization, biodiversity, population, political governance, and socio-economic characteristics. Maps and tables were used effectively in showing distribution of natural resources.

The second chapter (Land and Agriculture) gives figures on the nations land area (about 75 million hectares) and also covers landuse systems, agrochemical and pesticide use by commercial farmers especially. These issues are well covered using tables, colour photographs, and maps.

Chapter 3 is a brief on National Parks and Wildlife and addresses issues on vegetation, conservation, and biodiversity. Vital statistics on the nineteen national parks on protected animals, birds, game, elephant populations and their trends are given. A map is used showing location of national parks and game management areas. This chapter is only two pages text and a map.

Forestry (Chapter 4) is dealt with in detail and states that no comprehensive forestry inventory has been carried out since 1967. Forests management and various acts (legislation) are mentioned but not discussed, whilst classification tables use both the indigenous / common names for tree species. All the data supplied is in table form, apart for the map showing location of forests.

Chapter 5 is a one and half page brief chapter on fisheries. It gives tables, and statistics on fish types, species, and production yields for all the lakes in Zambia though recent data is lacking. The next chapter is on energy and covers consumption of different non-renewable and renewable energy resources. Solar and wind energy data was gathered by the Meteorological Department from established stations and surveys carried out by the Forestry Department, World Bank and the World Conservation Resource Survey.

The following chapter, Chapter 7 looks at the major economic activities of the major minerals, especially copper, in the country. Data on the major mineral trends is lacking with the environmental problems associated with mining being highlighted minimally. A map is used to show the distribution of mineral deposits. Air pollution, mine waste, chemical pollution are mentioned as well as legislation enacted by the Environmental Council of Zambia aimed at protecting land, water, air and wildlife, but the actual impacts are not supported with indicators.

Chapter 8 on Water - both surface and ground - gives data using tables and maps on lakes, water use, supply, quality, pollution and effects in the major cities. The next chapter is on waste management and looks at the state of affairs and points out the major problem areas of waste management. It gives statistics and regulations currently in force highlighting the handling of clinical drugs, domestic, industrial, chemical and hazardous waste.

Air and Noise pollution control is addressed in Chapter 10 and it has been noted that there is insufficient data on air quality because very little research is done in that area. However sources of emissions causing air pollution and noise are pointed out. There is no concrete legislation for noise and air pollution in place yet according to this chapter.

Chapter 11 is on Agrochemicals and Industrial Chemicals and gives vital statistics the use and quanti-

ties of chemicals such as fertilizers, pesticides and metals from mines. Photographs, tables and a map showing pesticide distribution in Zambia are used.

In the next chapter Environmental Legislation and Institutions are dealt with and there is a detailed description of the 28 environmental pieces of legislation (various acts and laws). It examines the existing legal framework and the conflicts between various institutions on law enforcement and duplication of work. Detailed case studies of environmental laws are given including the international and regional conventions and agreements to which Zambia is party. No illustrations, graphs, or tables were used.

Chapter 13 is on environmental impact assessments and deals with the history, problems and implementation of EIA's in Zambia. Their importance in environmental management and the role of institutions such as Environmental Council of Zambia is discussed.

The final chapter looks at Environmental Awareness and discusses the role of environmental education/awareness in changing people's attitude on natural resources management. However there are no statistics given as to the extent of awareness and the level of environmental education in both rural and urban areas as the information is general though photographs were used.

13.3 Conclusions

It is clear that the 1994 SOE report was a successful early attempt, and considerable effort was made in the areas of presentation, although some details were lacking. In particular:

- The methodology used is not clear to follow. The report seems to identify the issues without substantiating them with valid data.
- The approach used to delimitate chapters and sections is very inconvenient, so that issues are scattered across chapters in certain cases. Some chapters need not have been separated. Examples include those on pollution, land and agriculture and parks and wildlife.
- Most chapters range between one and four pages making them too short to effectively address an issue.
- The separate chapter on EIA could have been part of the policy chapter.
- Most data is presented using tables of raw data that makes it both monotonous and difficult to observe any emerging trends.
- Some graphics and picture do not show clearly.

Zimbabwe

14.1 Background

Zimbabwe produced the first national SOE report in the region in 1992. Although not very detailed, it assisted in raising awareness on the SOE concept in the country and the region at large. Zimbabwe also went some way in its 1998 report in trying to apply a formal methodology, the pressure state response model (PSR). Zimbabwe is the only country in the region that has completed two SOE reports, although the first one is not as comprehensive as the second one. Another striking feature of the processes in the country is the large difference between the two national reports. While the 1992 report is merely a few pages long, the 1998 report is a mammoth 509 pages, and covers most issues with some detail. This assessment was carried out for the 1998 report.

14.2 Assessment of the 1998 SOE Report

The report was published after a two-year intensive process that had supporting activities including provincial workshops, leaflets and posters. A team of experts was drawn from different walks of life to prepare the report.

Each chapter is introduced with a contents page showing the covered issues, and it also gives details on all the participants who contributed on the issues discussed in the topics. The introduction discusses the use of resources in the pre and post independence era, giving details of how the indigenous people were deprived of the privilege of accessing their own resources while the colonialists had acquired 'rights' to exploit them. The key environmental issues discussed include land, freshwater resources, drought, forests, biodiversity, industrialization, urban environment, poverty and the atmosphere. These were elaborated with aid of pictures and a summery of the issue in a side column. It makes the report appealing and it becomes easy to follow ideas. Colour contrast was used for issues that are brief and need immediate attention from the reader.

Environmental developments were also discussed such as the recent introduction of CAMPFIRE activities that generate revenue for community projects which they use to develop their areas. The report also discussed Zimbabwe's involvement in international policy discussions with other countries worldwide concerning issues of the environment, including conventions ratified by Zimbabwe. The socio-economic issues topic covers population, education, poverty, urbanization, fisheries, tourism, government and responses, and finally gives a way forward on the discussed issues. Every issue is discussed at length giving details on developments since independence and in some cases giving the pre-independence scenario. There is a logical flow of ideas.

A colourful map was used to show Zimbabwean provinces, bar graphs to show population growth since the beginning of the century and poverty data in both rural and urban areas. These were lined with the corresponding paragraphs and their sources were acknowledged. The report also made use of structured tables to summarise information collected from different sources. It shows considerable research has been carried.

The chapter on the atmosphere covered the Zimbabwean atmosphere, regional climatic influences on the seasonal patterns in Zimbabwe, and the effects of different climatic issues on the environment and human health. Information is presented with the aid of regional maps showing climatic conditions which affect Zimbabwe and maps showing temperature and rainfall variations. Boxes which contain brief information or summaries on issues that affect the environment were also used, tables with recorded data on pollution and its effects on the environment. Pictures were also used to emphasise the presented facts, for example the effects of drought on wildlife and emission of gases from industries and by vehicles.

On land resources the report discusses the use of land for crop production, livestock, types of soils in

Zimbabwe, policies and legislation, and various forms of land use. The report applied the pressure- state-response model to give brief details on land quality indicators and data needs. This chapter also goes into details on land resettlement that is a controversial issue at present in Zimbabwe.

The chapter on water resources discussed the demand for water, which is becoming a scarce resource in Zimbabwe due to growing domestic needs, agriculture, industry and also the cost of water treatment. It also covered the various water bodies common in Zimbabwe, water borne diseases, pollution and sewage treatments. Common methods used for emphasizing the issues being discussed included graphs and tables, and photographs.

Many consultants well-versed in the biodiversity subject contributed to the chapter on the subject. The chapter touches on all the aspects that make up the biodiversity in Zimbabwe. These include: forest ecosystems, wildlife, aquatic fauna and flora, and agriculture. A map was used to show the different regions.

The research, inventory and monitoring chapter was very long and has indicators for sustainable development. It is subdivided into topics detailed with information on human development baselines and indicators; environmental baselines and indicators; data management in different sectors; and data collection and handling. The chapter is introduced by identifying the requirements of sustainable development and the need for research. It also defines monitoring and its importance to the collection of information because sustainable development requires information over periods of time. The contents of this chapter are summarised as questions in a box and this makes it more interesting for the readers since they find answers to the questions as they read along. The pressure state response framework is discussed in detail in a box with diagrams drawn to explain it. It was also used to report on the land quality indicators.

The shaded graphs used to present in this chapter are clear and interesting to follow but it would be difficult for one to interpolate the figures from the graph. The composite graphs used in this chapter are clear but they are more advanced for a person without the knowledge of graphs. The topic on soil was researched well, with scientific experts employed. Simple language might have been used but some of the information needed a deeper understanding of chemistry, especially the part on salinisation. The chapter also discusses data management in different research institutes, from collection to interpretation of results.

The chapter on ecological regions identifies people and ecosystems and the process of their classifications. Maps were used to show the location of each ecoregion and the chapter also discusses common activities found in each region, the common type of vegetation and wildlife. The maps were clear and colour distinction was used to identify the region in question.

The report is concluded by a summery on the state of the environment. It is made up of topics which discuss the pressure on the environment, current states, responses to the environmental problems, and finally gives the way forward. These issues were explained with the aid of tables that present summaries of the selected major pressures, responses, and aspects of the state of the environment.

14.3 Conclusions

The 1998 SOE report for Zimbabwe was well presented, and its accesible writing style makes it easy to use and understand. It also includes a glossary that has definitions of words used in the report, common and scientific names, and units of measure and symbols. The report is useable by people from different walks of life: academics, politicians and the general public. It also included contents page for each chapter for one to identify certain topics of interest, without having to read the unnecessary information. The following areas have been deemed general conclusions needing attention:

- Considerable data that has been provided raw could have been analysed to reveal the underlying information.
- While cartography has been employed, other techniques such as GIS could add value to the overall product.
- The linkages across chapters, especially if one wishes to follow a an issue such as population or poverty, are not well developed. An index of terms at the end of the report could be useful in this respect.
- The language in certain chapters was rather too technical, limiting its usability by non-technical audiences. Such technical material could be presented in optional boxes, footnotes, or appendices without loss of quality.

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The World Conservation Union

SARDC
Southern African Research and Documentation Centre

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