STATE OF THE ENVIRONMENT REPORTING (SOER) AND THE POLICY PROCESS IN SOUTH AFRICA: LEARNING FOR THE FUTURE

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ABSTRACT

Environmental policy and decision making has undergone several changes in recent times, and in today's society is influenced by amongst others two key movements; the rise of an informational society and the increasing priority of environmental issues and Sustainable Development (SD) goals. The interplay between these movements appears to frame the context within which decision making of societies must take place, from an individual to an international scale.

In addition, environmental policy and decision making involves addressing issues that contain complex scientific aspects as well as values, ethics and other forms of knowledge and concerns. As such, effective policies and decisions require reliable information. Countries may undertake environmental reporting for this purpose, many in the form of State of the Environment Reporting (SOER). A main aim of SOER is therefore to aid decision makers by providing current scientific data in a user-friendly and appropriate format. However, there is little evidence to suggest that at present SOER and indicators have engaged with the processes of policy design and implementation to the extent that is possible. The Master of Science thesis upon which this paper is based contributes to addressing the above challenge by exploring the ways in which environmental policy making and related decision making can be more effectively supported by the science and research that find form in SOER and its indicators.

Through analysing the challenges and learning of experienced SOER practitioners and government officials in South Africa, this research finds that while previously the fields of science and policy-related decision making may have operated largely separate from one another due to their different natures, the shift to a society comprised of interconnected networks, more fluid boundaries and greater recognition of uncertainty and interdependence, has made it clear that these cannot exist in isolation. SOER appears to have developed in response to the rise in importance of environmental issues, but continues to evolve in response to the need to bridge the gap between science and decision making in the environmental arena.

Although a relatively new environmental tool in South Africa, SOER has already made some progress in highlighting the importance of understanding the status of environmental issues and incorporating this information into decision making. However, this study suggests that many factors currently limit the effectiveness of SOER. Despite this, many opportunities exist to facilitate the use of information contained within SOER in policy-related decision making. Some key results useful to practitioners will be highlighted in this paper. These summarised lessons

and challenges aim to stimulate thought into the more constructive use of environmental information in decision making.

THE PROBLEM

Environmental policy and decision making requires addressing issues which are difficult and uncertain; often involving physical, chemical, biological, technological, economic, psychological, ethical, legal and political factors. As such, effective policies and decisions require reliable information (Taylor *et al*, 2003). There is a recognition (for example, in Agenda 21 (UN, 1992)) that monitoring and reporting should take place to provide access to information to make the necessary choices or trade offs. Countries may undertake environmental reporting for this purpose, many in the form of State of the Environment Reporting (SOER). A main aim of SOER is therefore to aid decision makers by providing current scientific data in a user-friendly and appropriate format.

SOER is undertaken in numerous countries and at national, provincial, regional and local levels (Rump, 1996; Muller *et al*, 2006). These reports tend to be the result of a stand-alone process and focus on understanding the current condition of the biophysical environment and its links to related social, economic and institutional issues; the depth at which links are discussed depending on the country. To date there are few reviews available worldwide that advance the process and outcomes of SOER, although in recent years more attempts have been made to share learning between those involved. A greater amount of research has been undertaken to improve the development and scientific integrity of particular environmental indicators, but on the whole this work does not appear to be linked to the broader decision making processes it aims to assist.

In short, there is little evidence to suggest that at present SOER and indicators have engaged with the processes of policy design and implementation to the extent that is possible, and little is known about environmental information in policy making field. Briggs (1993) ends his review of SOER with a challenge, which summarizes his reasoning for the gap evident between SOER and policy practice:

> *"The role of SOER is not merely to provide information. Its ultimate aim is to improve environmental management and protection by helping to inform and direct policy development... If SOER is to become an effective part of the policy-making process... its role within the decision-system must be much more explicitly addressed" (Briggs, 1993).*

It is clear that more needs to be done to understand the links between the two processes and to stimulate more constructive use of the information within SOERs.

This paper highlights some of the key findings of a Master of Science degree completed in 2006. The purpose of the thesis is to explore the ways in which environmental policy making and related decision making can be effectively supported by the science and research that find form in SOER and its indicators. As such, the ultimate outcome desired is to facilitate sound environmental management and the pursuit of environmentally (in the broadest sense of the word) sustainable outcomes.

The research thus aims to *understand the role of SOER in the policy process in South Africa, and suggest ways in which the interaction between the two processes can be improved*. It is clear that much work and debate needs to take place to reach this goal, and this research contributes by being a starting point for the discussions required. In order to achieve the stated aim, this study stated the following objectives:

- To understand the impact (intended and actual) of SOER in South Africa, and the perceived reasons for this impact;

- To identify the current and potential links between the policy process/dialogue and SOER (scientific discourse) at national, provincial and city government levels; and
- To suggest improvements to the SOER process, including the indicator development process.

A paper presented by the author at an earlier IAIAsa conference (Will, 2004), outlines the initial research undertaken to understand the role of SOER in the policy process in South Africa, and included detailed descriptions of a typical policy making process, as well as tools for monitoring and reporting (SOER and sustainability indicators). This paper will therefore not elaborate on the definitions and purpose of these processes and tools for a second time, but will instead concentrate on providing some key findings of the above research. A brief theoretical background to the study will first be provided, followed by information on the case studies investigated. Some key results will then be highlighted and linked to practical suggestions for environmental management practitioners. While the results speak specifically about SOER, it is advocated that the principles behind the recommendations made could be applicable to other environmental management tools designed to aid decision making.

BACKGROUND

Several significant events have transformed society in recent decades, and these have been noted by numerous scholars as having a dramatic effect on human existence. The changes relevant to this study were grouped into two aspects, namely the rise of the 'informational society' (Castells, 1996), and the rising priority of environmental issues and Sustainable Development (SD) goals. These revolutions influence the way in which people live in, interact with and understand the world around them; and the interplay between these movements sets the context within which decision making of societies must take place, from an individual to an international scale. An understanding of these movements is important as they form the framing context within which both contemporary policy-making activities and tools for environmental management (in this case, SOER) exist, and therefore are likely to be a key source of both challenges and solutions for linking such processes effectively.

The rise of environmental issues and SD thinking

In the last four decades, the phenomenon that Dryzek (1997) calls 'the politics of the earth' has presented a large and growing range of interlinked environmental issues. Dryzek (1997) notes that the environmental arena has sparked some intense debates and disputes, "ranging from the details on the implementation of policy choices in particular localities, to the arguments of philosophers debating the appropriate ethical position to apply to environmental affairs in general". A contributing factor is that people understand environmental affairs in dramatically different ways (i.e. subscribe to different discourses), which is influenced by their individual backgrounds and up-bringing as well as the norms established by their society. Key to this is that environmental issues seldom can be understood and explained in a well-defined manner, but instead are perceived in several different ways. Experience has shown that those involved with a particular problem usually see the issues at hand in sharp contrast, meaning the way that issue is dealt with depends largely on the balance of power between these competing perspectives (Dryzek, 1997).

The varying views on environmental issues has consequences for the politics and policies that come about with regard to them. When human decision systems (be they individuals or collective bodies such as governments) confront environmental problems, they are faced with two orders of complexity. Both ecosystems and social systems are complex and knowledge of them, although growing, is limited. As environmental problems are located at the intersection of ecosystems and social systems, it is not surprising that they seem to more difficult to comprehend (Dryzek, 1997). In addition, the more complex a problem the greater the number of plausible perspectives on it, and the harder it is to prove any one of them to be wrong. A good example of this ambiguity is presented by Owens and Owens (1991), who assert that conflicts often arise during decision making where participants must weigh

costs and benefits of an activity against each other to come to a conclusion. The challenge in this example is that not every environmental benefit that people value can easily be quantified in monetary terms and that environmental costs can be uncertain, long-term or intangible (like those related to cultural or aesthetic values).

Changing decision making practices

The dominant structures and processes of today's 'informational society' are increasingly organised in networks (sets of interconnected nodes), as these accommodate and facilitate the informational mode of development (where information is a key resource and product). While the networking structure for social organisation has existed in other times and spaces, the current transport, information and communication technologies provide the basis for its expansion throughout the entire social system. Christoff (1996) highlights the globalising force of these modern technologies; namely increasing the flow of individuals, commodities, cultures and pollution across territorial borders.

This being the case, it follows that an actor's presence or absence in a network, and/or the dynamics of a network in relation to others, are critical sources of domination and change in a society. The network society therefore becomes characterised by extremes where, for example, individuals, groups, regions and even countries are selectively switched on and off in an endless flow of strategic decisions based on their relevance in fulfilling the goals of the network. All of the above has considerable implications for how activities are undertaken; importantly, it has stimulated changes in approaches to both governance (including decision making) and to the use of information.

Aligned with, and perhaps in response to, the shift to the network society is an evolution in the nature of politics, the policy making process, and the decision making within it. This is perhaps best evident in the changing language used by those involved in these activities:

> *"A new vocabulary has emerged over the last ten years, where words including 'governance', 'institutional capacity', 'networks', 'complexity', 'trust', 'deliberation' and 'interdependence' dominate over 'government', 'power', 'authority', 'loyalty', 'participation' and 'interest groups' " (Hajer and Wagenaar, 2004).*

Hajer and Wagenaar (2004) attribute this to an ever increasing appreciation of the importance of these new political practices in reducing the 'implementation deficit' of previous years. Role-players have realized that the most effective political agreements or plans are created by expanding the circle of involvement – Warren (1992) termed this 'expansive democracy' – and making an effort to find solutions acceptable to all who participate. Solutions for many urgent and complex problems (for example, poverty or pollution) are no longer found within the long-established systems of politics and administration. Over time, organisations, businesses and government departments have become aware of the benefits of having more fluid boundaries; as practical needs have driven the development of co-operative efforts among wider networks of actors (Hajer and Wagenaar, 2004). Therefore, as the above suggests, these new inter-organisational networks have reshaped what politics and policy making are about in the network society.

Scientific information in decision making

Knowledge is power, particularly in the informational society where we are told that that our future will be significantly influenced by how we put information to use (Arendal, 2000). Information helps in decision-making, however, the nature of these decisions and the role information plays in decision-making processes can vary considerably. Over the last decades there has been a growing demand for environmental information, as people have been sensitised to environmental problems. Arendal (2000)

note that a driving force behind this interest has been the empowerment of individuals with "knowledge that can help them make their influences felt on policy and decision mak[ing] in both the public and private sectors".

Scientific information plays an important role in environmental policy and decision-making. Activities that have the potential to give rise to undesirable environmental effects, whether they are of global, national or local significance, have often relied on scientific advice to identify, prioritise and guide decisions on managing such effects. Depending on the state of scientific knowledge, the application of science as a basis for policy and decision-making can influence decision makers' expectations about the certainty of environmental outcomes (Taylor *et al*, 2003).

In terms of environmental assessment and management, a 'toolkit' of assessment and appraisal tools has developed to predict and evaluate the consequences of certain human activities, and in so doing attempt to minimise and mitigate potential risks to society and the biophysical environment. Tools for monitoring and reporting are included in this 'toolkit', and are seen along with other tools to have been afforded an increasingly important role in environmental policy (Owens *et al*, 2004). Tools for monitoring and reporting should provide critical feedback about the impact and effectiveness of an activity, project or intervention. However, further attention needs to be focused on understanding the use and communication of SOE information via indicators, particularly in the policy making arena.

THE STUDY AREAS

An inductive and qualitative methodology was adopted in this research to ensure that the results are relevant and appropriate to the current situation experienced by those involved with SOER in South Africa. Interviews were conducted with targeted stakeholders from the department responsible for the SOER at each level. These stakeholders were chosen because they are responsible for driving and coordinating the SOER process within their level of government, and therefore have hand first fand experience of the topic of concern in this study. In the national and provincial case, where a consultant had played a substantial role in the compilation of the SOER, these people were also interviewed. In the case study chosen for the local level, the responsible person undertook the SOER largely internally and therefore no consultant was interviewed.

Key lessons and challenges were extracted from interviews conducted in each case study area, and analysed using discourse analysis methodology. These findings were used to test and confirm suggestions for the way forward. To focus the scope of the research three related case studies, from national, provincial and city/local level reporting authorities, were chosen (Table 1).

Table 1: A summary of case studies investigated

Responsible Department	The City of Cape Town (City of Cape Town, 2005)	Western Cape Province Department of Environmental Affairs and Development Planning (DEAEP, 2005)	National Department of Environmental Affairs and Tourism: SOE Directorate (DEAT: SOER) (DEAT, 2005)
Year(s) completed	1998, 1999, 2000, 2001, 2002	2005	1999 and 2006
Aim	To provide information to the public, industry, non-government organisations and all levels of government, to ensure better decisions are made on issues which influence or are influenced by the environment	To provide credible information to inform strategies and track interventions in order to assist politicians and decision makers as they strive towards the goal of achieving a sustainable province.	To be the major mechanism through which resource management and environmental issues are comprehensively reported and analysed on scales that transcend local authority and provincial boundaries.
Themes	• Air Quality & Atmosphere; • Inland Waters; • Coastal waters;	• Air Quality & Climate; • Biodiversity; • Inland water & Water	• Atmosphere; • Terrestrial ecosystems; • Inland water;

	• Health; • Biodiversity; • Urbanisation; • Infrastructure; • Transport; • Energy; • Waste; • Economy; • Education; • Safety & Security; and • Governance.	Supply; • Coastal Zone; • Land; • Waste & Sanitation; • Energy; • Health; • Education; • Economics & Poverty; • Tourism; • Urban development; • Transport; and • Safety and security.	• Coastal & marine ecosystems; • Biodiversity; • Human settlements; • Environmental Governance; • Human vulnerability; and • Antarctica & other external territories.
Products	• A state of the environment report, based on specialist studies	• A state of the environment report, based on specialist studies; • A summary state of the environment report, based on the full report.	• A state of the environment report, based on the specialist studies; • A short, plain language Internet report; • Issue summaries; • Regular newsletters; and • An assessment of the impact of the national state of the environment initiative, with an impact report.

All interviews followed a similar procedure, which allowed for a high level of consistency in the data collection process. As discourse is a means through which "actors … *create* the world" (Hajer 1993; in Bulkeley, 2000), deconstructing a discourse's story lines is a way of understanding why a situation currently exists. Since this study aimed to investigate the links between SOER and policy processes, the discourse analysis approach was employed to highlight the existing storylines (ways used to explain a perceived reality) from the interviews conducted with key actors driving SOER in the case study concerned. A semi-structured questionnaire with open-ended questions was utilized in each interview to stimulate discussion of the stakeholder's understanding of policy and SOER processes, highlighting key challenges and suggestions for addressing these concerns.

Types of storylines uncovered include those explaining perceived problems and learning, with reasons for these. The story lines were used to define the evident discourses that form the basis for recommendations about enhancing the SOER process for environmental policy and related decision making. Once each discourse was identified, its story lines and sub-story lines were verified against literature available. Care was taken to review whether relevant literature supports the understandings of a discourse, and visa versa. Commonalities and differences were highlighted, and possible explanations for these positions and opinions were discussed. The outcomes of the above process include recommendations for the future of SOER.

SOME KEY FINDINGS

Science is missing the mark

Science is regarded as one of the ways in which information is made available for decision making. While not down-playing other forms of knowledge, the importance of science is clearly evident to those involved with SOER; as a method of understanding and monitoring the nature and status of an issue and as a means of suggesting possible interventions to mitigate against negative trends. However, gaps in scientific knowledge and inaccessibility of results (either because they are complex, technical

and situation-specific or because they are presented in little known publications) means that scientific information is not properly fulfilling one of its key functions: informing and guiding decision making. Several critical factors must be present to ensure successful connection of science with decision making, including:

- the integrity of the scientific process;
- the skill of scientists to take sometimes complex and highly technical data and convert it into information that contributes to environmental policy and decision-making in a timely manner;
- the skill of policy analysts to critique, accurately interpret and use scientific information for policy purposes, while being explicit about any limitations and uncertainties associated with that information; and
- the capacity of policy and decision makers to understand the scientific and other information they receive, and the consequences of the choices they make.

Therefore on the part of SOER practitioners, attention must be paid to improving the science behind the SOER process (in particular, indicator development and interpretation) as well as to investigating identified data gaps. This work will draw on more established research fields such as ecology or sociology in order to better understand and therefore simplify complex realities using indicators, and will also need to develop mechanisms to ensure a rigorous process is followed when analyzing the indicator results.

The nature of policy-type decision making poses an extreme challenge

A key reason behind why scientists find linking to the policy process so difficult is noted to be that the two processes are very different in nature. Science is understood as a rational, logical and rigorous investigation of reality, which differs strongly from how the policy process is perceived. The policy process appears to be separate from scientific endeavor, requiring rapid answers to questions and being more easily influenced by powerful role-players.

In terms of SOER, it appears that the responsible reporting departments or individuals fall outside of the traditional decision making structures of government, and are tasked to provide information to these structures without a real understanding of how they operate and what they aim to do. While this arrangement makes wise use of available information/support personnel within government, the linking of knowledge generators with the processes or needs of knowledge users does not seem firmly established or understood. For SOER, this means that those compiling the reports and interpreting its indicators cannot easily do so with particular insights for strategic decision making in mind. This could lead to the analysis of issues being restricted and ultimately less relevant to this target audience.

Current SOER has value but this can be improved

To date, the SOERs conducted in South Africa are seen to have transformed the fragmented environmental data that is available into more meaningful information, and this has been valuable for awareness raising in particular. However, several areas have been identified where improvements can be made to stimulate greater influence within decision making processes.

In order for SOER to have the greatest impact possible it must remain focused on advancing its central objectives (see Rump, 1996) and not be diverted by attempting to respond to calls for the report to become a spatial or action planning tool. Effort must be directed into correcting misconceptions about the SOER process so that its usefulness as an empowerment and strategic, integrative monitoring tool is strengthened. Several key recommendations have been made by those interviewed for advancing the SOER *process* undertaken to ultimately compile the reporting products (i.e. in addition to improving

the *science* behind the process). These relate to refining the consultation process, including specialists in a more creative manner, incorporating greater flexibility into the planning stages, and adding additional value to the products by exploring scenarios and action plans for future reporting.

Another way in which SOER could attempt to lessen the problems posed by the nature of policy making is to explicitly link information held within the reports to phases in appropriate decision-making cycles. For example, SOER could help to identify new and emerging problems requiring policy intervention, provide baseline information about the condition of the environment at the policy formulation stage, and monitor whether the goals set in policy and planning processes are being reached, and that implementation is not detrimental to the environment.

Networks and connections must be built and strengthened

The influence of the rise of the informational society appears keenly felt by those involved with SOER. Those involved emphasise the need to maximize the benefits of functioning within a network society, since SOER by its nature attempts to integrate and understand changes in many components of the environment, involving the production of knowledge from several scientific fields. However, poorly developed communication networks are noted to greatly limit the effectiveness of the SOER process and products.

Another indication that current SOER and policy processes have implicitly begun adapting to a network society is that role-players seek to involve an ever increasing range of stakeholders and expert advisors. It appears, however, that in the case of SOER practioners find it difficult to extend their network as a priority between other government departments responsible for generating useful environmental information. As Meadows (1999) notes, what holds a network together are shared values and the understanding that some tasks can be accomplished together that could never be accomplished separately. With this in mind, those involved with SOER in South Africa will need to focus attention to better understanding and strengthening the existing dynamics between SOER and policy-related decision making networks in South Africa, if SOER is to have the greatest impact.

An additional critical factor highlighted is that SOER should strengthen its position through linking and coordinating with other environmental assessment, planning and reporting tools. These partnerships would confirm the niche for SOER in South Africa and highlight its value in decision making networks.

Increased capacity and profile are two final key ingredients

A key concern is that low capacity is linked to poor implementation – and this situation will need to be addressed in order to effectively attend to the interventions and focus areas suggested in the previous four sections. In addition, a connection made between capacity and profile highlights an interesting point: without the capacity to drive the process from within the responsible government department, it is unlikely that the process and its products will ever reach the profile required to develop and maintain the networks and buy-in required to implement successfully in the long term. Careful consideration needs to be given to placing the responsibility of SOER with an appropriately skilled and passionate team or individual, in order to create the necessary partnerships, linkages and improvements.

SUMMATION

SOER, although a relatively new environmental tool in South Africa, has already made some progress in highlighting the importance of understanding the status of environmental issues and incorporating this information into decision making. However, as this paper suggests, many factors currently limit

the effectiveness of SOER. These range from the developing science behind the process and the way in which the process is run (including the manner in which role-players are involved and the way results are communicated), to the way in which the process is viewed by decision makers external to it and the constraints posed by low human and financial capacity in South Africa.

SOER can contribute at several stages in policy and decision making processes by presenting information that raises awareness, allows the evaluation of alternative policy options and assists with overall policy performance measurement. Some keys results confirmed by this research are that the SOER practitioners should collaboratively:

- Focus on maturing the science behind the SOER process;
- Understand the target audience and their needs more clearly;
- Agree on how the SOER process should be further developed and for what purpose;
- Improve the communication and interpretation of scientific advice to policy and decision makers;
- Incorporate learning back into the SOER programme in South Africa;
- Identify and maintain active networks, maximising the benefits offered by the informational society;
- Link to phases of appropriate decision making cycles, so that this information is fed in at the right time and place; and
- Maximise broader benefits of the SOER process (e.g. strengthening capacity, raising awareness, enhancing participation) through facilitating directed use of environmental information.

Better links between the SOER process and the policy making process would allow for information in the reports to perhaps influence the vision for the region concerned, as well as be able to broadly assess and track progress to reaching certain SD objectives. But most importantly in terms of policy making, it is hoped that such tools can assist in empowering and equipping the decision makers with adequate, suitable information to make the critical decisions at each stage of their process, as well as encouraging discussion of key issues between those involved and enable shared learning.

REFERENCES

Arendal (2001) *Impact of environmental information on decision-making processes and the environment*. UNEP/GRID-Arendal.

Briggs, D. J (1993) State of Environment Reporting. in Nath B, Hens L and Devuyst D (eds). 1993. *Environmental Management: Instruments for Implementation*. UNESCO, VUB Press.

Bulkeley, H (2000) Discourse coalitions and the Australian climate change policy network in *Environment and Planning C: Government and Policy*, 18(6), 727 – 748.

Castells, M (1996) *The rise of the network society*. Volume 1, 2 and 3 (second edition). Blackwell Publishers, Oxford.

Christoff, P (1996) Ecological Modernisation, Ecological Modernities. *Environmental Politics*, 5(3), 476-500.

City of Cape Town (2005) *City of Cape Town: Environmental Management: State of the Environment Report*. Available online at: http://www.capetown.gov.za/soe

DEAT (2005) *National State of the Environment Initiative*. Available online at: http://www.environment.gov.za

DEADP (2005) *Western Cape State of the Environment Report 2005 (Year One)*. Department of Environmental Affairs and Development Planning, Provincial Government of the Western Cape.

Dryzek, J. S (1997) *The Politics of the Earth: Environmental Discourses*. Oxford University Press, Oxford.

Esty, D.C., Marc L., Srebotnjak, T. and de Sherbinin, A (2005) *2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship*. New Haven: Yale Centre for Environmental Law and Policy.

Hajer, M. A (1995) *The Politics of Environmental Discourse. Ecological Modernisation and the Policy Process*. Oxford University Press, Oxford.

Hajer, M. A and Wagenaar, H. (eds) (2004) *Deliberative Policy Analysis: Understanding Governance in the Network Society,* Cambridge University Press, Cambridge.

Hezri, A.A. and Hasan, M.N (2004) Management framework for sustainable development indicators in the State of Selangor, Malaysia. *Ecological Indicators* 4, 287-304.

Meadows, D (1998) *Indicators and Information Systems for Sustainable Development*. A report for the Balaton Group, The Sustainability Institute, Hartland.

Muller, E., Pretorius, R. Patrick, M., Will, C., Binedell, M. and Ramasar, V (2006). *The State of State of the Environment Reporting in South Africa*. Journal of Environmental Assessment, Policy and Management (JEAPM) Vol. 8 (2).

Owens, s. and Owens. P.L (1991) *Environment, Resources and Conservation*. Cambridge University Press, London.

Rump, P (1996) *State of the Environment Reporting: Source Book of Methods and Approaches*. UNEP/DEIA/TR.96-1. ISBN 92-807-1583-6

Taylor, B. Green, W. and Cooper, R (2003) *Illuminated or blinded by science? A discussion paper on the role of science in environmental policy and decision-making*. Report compiled for the Office of the Parliamentary Commissioner for the Environment, Wellington. ISBN 1-877274-09-7

Taylor, B. Green, W. and Phipps, H (2004) *Missing Links: Connecting science with environmental policy*. Report compiled for the Office of the Parliamentary Commissioner for the Environment, Wellington. ISBN 1-877274-52-6

Thomas, E (1997) *State of the Environment Reporting: A Review of the Concept and its History, and its Application to the City of Gold Coast*. Environmental Research Studies No. 1. Produced by Research Unit, Planning Development & Transport Directorate, Australia.

Will, C. (2004) State of the Environment (SoE) reporting and the policy process in South Africa: The transformation into a sustainable future? Paper Presentation for the IAIA South African chapter Conference 2004 Champagne Sports Resort, KZN.