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Does enhanced regulation improve EIA report quality? Lessons from South Africa

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Abstract

Recently, various EIA systems have been subjected to system review processes with a view to improve performance. Many of these reviews resulted in some form of legislative reform. The South African Environmental Impact Assessment (EIA) regulations were modified in 2006 with the express intent to improve EIA effectiveness. In order to evaluate to what extent the desired outcome was achieved, the quality of EIA reports produced under the 2006 regulations was investigated for comparative analysis with the preceding regime. A sample of EIA reports from the two legislative regimes was reviewed using an adapted version of a well established method known colloquially as the "Lee and Colley" review package. Despite some improvements in certain aspects, overall report quality has decreased slightly from the 1997 EIA regime. It therefore appears that the modifications to the regulations, often heralded as the solution to improvements in performance have not resulted in improved quality of EIA reports.

Key words: Environmental Impact Assessment, National Environmental Management Act, South Africa, Environmental Impact Assessment Report, EIA report quality, EIA regulations

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1. Introduction

Since the advent of Environmental Impact Assessment (EIA) in the USA in 1970 and its subsequent adoption around the globe, its effectiveness has been a particular concern in the EIA research and practice community (Barker and Wood, 1999; Christensen *et al.*, 2005; Retief and Chabalala, 2009; Heinma and Pöder, 2010). A common response to perceived poor performance of an EIA system is for the authorities to modify or tinker with the controlling legislation. For example the European Union started a review of the EIA Directive in 2007 under the title of ‘Better regulations for jobs and growth’ (European Commission, 2010). Furthermore, Canada, Australia and South Africa have all recently initiated or completed reviews of their EIA systems (SCESD, 2011; DEAT, 2008).

Effectiveness essentially refers to whether an EIA system achieves its objectives, at least cost with minimum delay and without bias or prejudice, and includes concepts such as efficiency of operations, fairness of procedures, cost-effectiveness of the operation, the potential to deliver a particular result, and compliance with specific procedural requirements (Sadler, 2004; Cashmore *et al.*, 2004; Jay *et al.*, 2007).

An important component of effectiveness deals with the quality of the Environmental Impact Report (EIR). Since effectiveness is an indication of the extent to which “ the EIA process ... has measured up to its procedural requirements and substantive purpose” (Sadler, 2004:249), there is a general assumption that poor quality reports could contribute to a degree of ineffectiveness since they contain the information related to the project and its likely consequences that is subsequently used in decision-making (Glasson *et al.*, 2005; Wood, 2003).

Extensive research has been conducted in both developed and developing countries to evaluate the quality of EIRs (Pardo, 1997; Androulidakis and Karakassis, 2005; Pinho *et al.*, 2007; Zeremariam and Quinn 2007; Jalava *et al.*, 2010). The weaknesses typically encountered include those relating to capacity of authorities involved, public participation, description of the methods used, impact prediction, EIA follow-up monitoring, and consideration of alternatives and cumulative impacts (Barker and Wood, 1999; Gray and Edwards-Jones, 1999; Canelas *et al.*, 2005; Tzoumis, 2007; Kruopienė *et al.*, 2009; Peterson, 2010).

The aim of this paper is to provide the first analysis of whether EIR quality improved following the major restructuring of the South African EIA regulations in 2006, through a review the quality of EIRs pre and post legislative reform in order to test if such reform has had the desired effect on report quality. The results described in this paper show that despite major restructuring of the South African EIA regulations in 2006, EIR quality has declined slightly under the new regulations.

The paper is structured around five sections. Firstly the EIA process in South Africa is described, followed by an explanation of the methodology, and then the analysis and results. This is followed by a discussion of the research findings, and the paper ends with conclusions regarding EIR quality under the new regulations and implications for the future.

2. EIA in South Africa

The EIA process in South Africa started on a non-mandatory basis in the 1970s when EIA was practiced voluntarily as part of Integrated Environmental Management (IEM). It became mandatory in September 1997 with the promulgation of EIA regulations in terms of the Environment Conservation Act (ECA) of 1989 (South Africa, 1989; South Africa, 1997a, b, c).

The EIA system established by these regulations consisted of the following main steps, in line with international practice:

- Submission of application for authorisation to undertake an activity;
- Scoping Report (including extensive public participation and plan of study for EIA);
- EIR (including public involvement, specialist reports and draft Environmental Management Plan);
- Review of EIR by the competent authority; and
- Environmental Authorization (including conditions of approval).

In particular, there was a requirement for comprehensive scoping and emphasis on extensive public participation. Some notable differences in the early years of South African EIA from international best practice were the virtual absence of time-frames (apart from time to respond to the public participation opportunities, and a 30-day period of appeal of the authorisation), and the lack of provision for follow-up after authorisation (Wood, 2003; Glazewski, 2005; Kidd and Retief, 2009).

Due to the requirement for *all* projects to undergo such comprehensive scoping and extensive public participation, the usual result was a drawn-out and expensive administrative procedure. Consequently, the majority of assessments (over 80%) were authorized on the basis of an extended Scoping Report in terms of Regulation no. 6(3) (a) (South Africa, 1997a). In these cases the content of the Scoping Report was extended to include more information than usually envisaged for a Scoping Report, but less than that for a formal full EIR as required by the 1997 regulations and international best practice. Sandham *et al.* (2005: 51) refer to it as the “beefed-up” Scoping Report or “mini-EIA”.

The ECA regulations had been in effect for just over a year when the first comprehensive environmental management legislation was promulgated in 1998 in the form of the National Environmental Management Act (NEMA), replacing some of the provisions of the ECA (Wood, 2003; Glazewski, 2005). Specifically, it did not replace the EIA provisions, which remained in force until new EIA regulations were promulgated in 2006 in terms of NEMA (South Africa, 1998; South Africa, 2006a, b, c; Kidd and Retief, 2009).

The main objective of the 2006 regulatory changes was the expedition of the authorization process (Kidd and Retief, 2009). The key changes in these new regulations included: exclusion of certain types of activities through more detailed thresholds; extension of the coverage of activities requiring EIA e.g. mining; institution of time frames; provision for post decision follow-up, and the introduction of two types of assessment processes i.e. Basic Assessment for smaller projects, and Full Assessment. The Basic Assessment process essentially formalized the “beefed-

up scoping” practice, while the Full Assessment restricted the more comprehensive scoping and assessment to larger projects with potentially significant impacts. The implications of the new regulations for EIRs, and hence for report quality, are summarised in Table 1. The empty cells indicate that there were no equivalent requirements for 1997, although some of them were available in the guideline document (DEAT, 1998).

The more comprehensive information requirement of the 2006 EIA regulations is evident and therefore it might be expected, or at least hoped, that significant differences in EIR quality would result under these regulations relative to the earlier arrangements.

Various studies have been conducted on the quality of EIRs under the 1997 (ECA) system in South Africa, including EIRs for a variety of projects in the North West Province (Sandham and Pretorius, 2008), for projects affecting wetlands (Sandham *et al.*, 2008b), for explosives industry projects (Van der Vyver, 2008), for the mining industry (Sandham *et al.*, 2008a), housing developments in the Mpumalanga province (Mbhele, 2009), and for the release of biological agents for the control of *Lantana camara* (lantana) (Sandham *et al.*, 2010). It was found that the quality of EIRs under the 1997 system was generally satisfactory, apart from the biological control EIRs which were all graded as poor. The results are generally in accord with the results of EIR quality findings from Europe (Barker and Wood, 1999; Lee, 2000; Canelas *et al.*, 2005; Pölonen *et al.*, 2010).

Since the promulgation of new EIA regulations in terms of NEMA in 2006, no research has been published regarding the EIA report quality under those regulations. This paper aims to address this gap in knowledge. The hypothesis, based on the general understanding that strong and clear legislation is a prerequisite to an effective EIA system (e.g. the first of the comparison criteria employed by Wood (2003) for evaluating EIA processes around the world), was that report quality under the 2006 regulations should be demonstrably superior to that under the 1997 system. Further modifications were made to the EIA system by the promulgation of revised regulations in 2010 (South Africa, 2010).

3. Materials and methods

Internationally the use of so-called review packages or checklists has been the main methodological approach to review the quality of EIRs. These approaches consist of a set of criteria compiled to evaluate how well a number of assessment and reporting tasks have been performed. In this instance, the "Lee and Colley" review package (Lee *et al.*, 1999) was chosen for the comparative analysis of EIR quality before and after 2006, because it is adaptable, easy to use, and it also provides a systematic, structured and objective approach to quality review (Lee *et al.*, 1999; Wood, 1999; Sandham and Pretorius, 2008). The widespread use of the package also allows for comparison of findings from this study with findings from international research.

3.1 The structure and use of the Lee and Colley review package

The Lee and Colley package is hierarchically structured around four review areas (Project & Environment, Impact Identification & Evaluation, Alternatives & Mitigation, Presentation & Communication) each made up of categories and more detailed sub-categories, as illustrated in Figure 1.

Table 1: Differences in EIR requirements between the 2006 and 1997 EIA regulations

2006 regulations: Regulation 32(2) (a-q) Government Notice R385 (South Africa, 2006c)	1997 regulations: Regulation 8 (a-c) Government Notice R1183 (South Africa, 1997a).
a) details of Environmental Assessment Practitioner (EAP) ¹ who prepares the EIR; and expertise of EAP to carry out an EIA	No equivalent requirements
b) detailed description of proposed activity	c) Appendices containing descriptions of the (ii) activity to be undertaken
c) description of property on which the activity is undertaken and location of activity on the property, or if it is – (i) linear activity, a description of the route of the activity; (ii) ocean-based activity, the coordinates where the activity is to be undertaken	No equivalent requirements
d) description of environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity	c) Appendices containing descriptions of the (i) environment concerned
e) details of public participation process (PPP) conducted	c) Appendices containing descriptions of (iii) the public participation process, including list of interested parties and their comments (iv) media coverage given to the proposed activity
f) description of the need and desirability of the proposed activity and identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	No equivalent requirements
g) indication of the methodology used in determining the significance of potential environmental impacts;	No equivalent requirements
h) description and comparative assessment of all alternatives identified during the EIA process;	b) A comparative assessment of feasible alternatives
i) summary of the findings and recommendations of any specialist report or report on a specialized process;	
j) description of all environmental issues that were identified during the EIA process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures	a) A description of each feasible alternative including: (i) extent and significance of each identified environmental impact (ii) the possibility for mitigation of each identified impact
k) an assessment of each identified potentially significant impact:	No equivalent requirements
(i) cumulative impacts;	
(ii) nature of the impact;	
(iii) extent and duration of the impact;	
(iv) probability of the impact occurring;	
(v) degree to which the impact can be reversed;	
(vi) degree to which the impact may cause irreplaceable loss (vii) the degree to which the impact can be mitigated;	
l) description of any assumptions, uncertainties and gaps in knowledge;	No equivalent requirements
m) opinion as to whether the activity should /should not be authorized, and any conditions in respect of authorization	No equivalent requirements
n) an environmental impact statement which contains –	No equivalent requirements
(i) summary of key findings of environmental impact assessment;	
(ii) comparative assessment of positive and negative implications of the proposed activity and identified alternatives	No equivalent requirements
o) draft EMP that complies with regulation 34;	No equivalent requirements
p) copies of specialist reports/ reports on specialized processes	No equivalent requirements
q) any specific information that may be required by the competent authority	c) Appendices containing descriptions of (v) any other information included in the accepted Plan of Study

¹ An EAP has a special role in South African legislation; in this instance we are referring to the independent consultant conducting the EIA on behalf of the developer/applicant

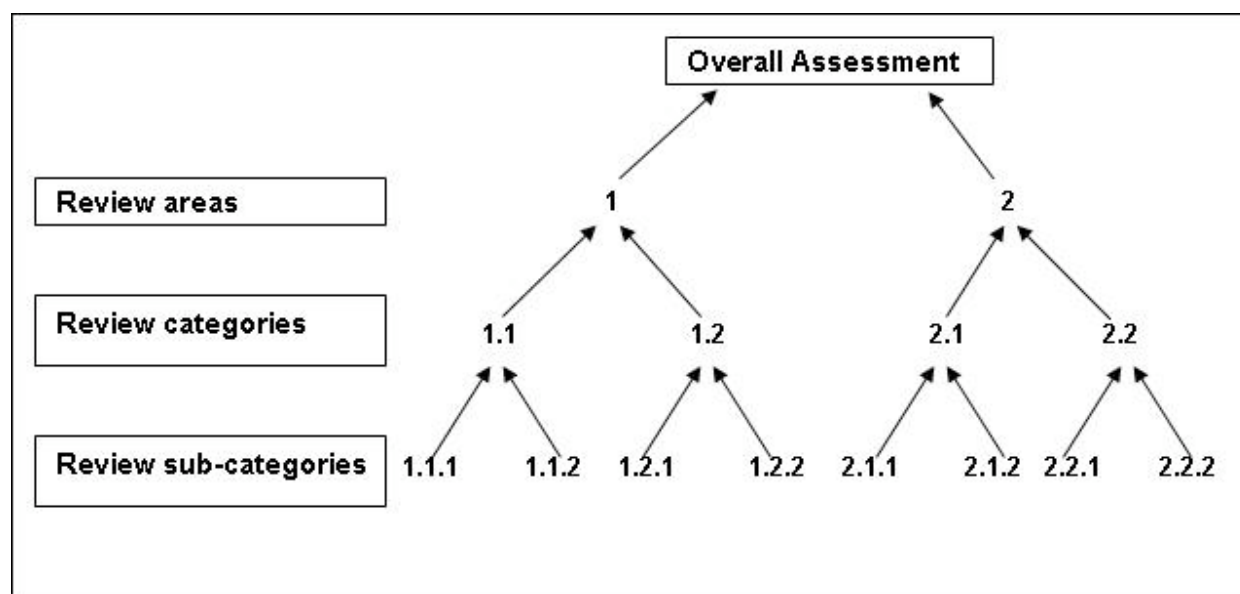


Figure 1: Hierarchical structure of the Lee and Colley review package (Lee *et al.*, 1999:6)

The review of an EIR starts at the lowest level – the sub-category – and grades are awarded ranging from A to F, depending on how well a specific task is judged by the reviewer to have been performed. Grades are then combined to give a grade for each category and then for each Review Area, and finally to provide an overall grade for the EIR. The results are then compiled and recorded on a collation sheet. The assessment grades are shown in Table 2.

Table 2: List of assessment grades (Lee *et al.*, 1999; Lee, 2000).

Grade	Explanation
A	Relevant tasks well performed, no important tasks left incomplete
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies.
E	Not satisfactory, significant omissions or inadequacies.
F	Very unsatisfactory, important task(s) poorly done or not attempted.
N/A	Not applicable. The Review topic is not applicable or is irrelevant in the context of this statement.

3.2 Adaptation of the review package

Due to certain unique features of the EIA system in South Africa, such as extensive public participation, the original Lee and Colley review package was adapted by making appropriate changes in the descriptions of sub-categories, and addition of new topics in order to allow for review of the South African EIA systems in 1997 and 2006, while assessing best practice. Ten sub-categories were *modified* by adding or changing descriptions to fit both the 1997 and 2006 regulations, and four *new* sub-categories were added. The adaptation of the Lee and Colley package appears in Appendix A. (see also Van Heerden, 2010).

3.3 Access to data and review sample

Since the advent of mandatory EIA in South Africa in 1997, environmental authorisation has been a national / provincial co-competency, with both national and provincial Environmental Departments empowered to issue such environmental authorisations. The areas of jurisdiction are clearly laid out in the regulations. Generally, EIA for projects that cross provincial, national or international boundaries, and applications by organs of state, are approved by the national environmental authority.

Previous research on EIR quality in South Africa made use of reports from a range of different sectors and provincial environmental authorities. In order to optimise comparison of EIR quality between the two regulatory regimes, it was decided to take the sample under the 2006 regulations only from the national authorising agency. Generally speaking these tend to be larger projects with potentially more significant impacts and consequently longer or more complex EIRs, providing sufficient material for quality analysis.

The sample was drawn from completed EIRs available at the Impact Assessment Directorate archives in Pretoria, based on pragmatic grounds of availability and accessibility. A total of 26 EIRs were available, comprising 11 under the 1997 EIA system and 15 under the 2006 EIA system (hereafter referred to as the 1997 and 2006 reports respectively). Application dates of the EIRs under the 1997 EIA system range from October 1997 to February 2006, and those under the 2006 EIA system from October 2006 to February 2008.

The sampled projects were from three major project types (also see Table 3):

1. Para-statal projects, including projects by the Electricity Supply Commission (Eskom), the South African National Roads Agency Limited (SANRAL), and Airports Company South Africa (ACSA);
2. Projects located in sensitive areas such as the establishment of lodges and nature trails in national parks; and
3. Projects by government departments such as the installation of underground storage tanks and the establishment of a forensic science laboratory.

It has been shown that the type of development may potentially affect the nature and quality of EIR obtained (Barker and Wood, 1999; Morrison-Saunders *et al.*, 2001), but the available projects were evenly spread across each major project type, although more government projects appeared in the 2006 sample.

Table 3: EIR sample grouped by project types

Project types	EIR sample: 1997 system				EIR sample: 2006 system			
	Eskom	SANRAL	ACSA	TOTAL	Eskom	SANRAL	ACSA	TOTAL
Parastatal	3	1	3	7	8	1	2	11
Sensitive areas	4				1			
Government departments	0				3			
TOTAL	11				15			

ACSA (Airports Company of South Africa)

SANRAL (South African National Roads Agency Limited)

Eskom (Electricity Supply Commission)

3.4 Review methodology

The adapted Lee and Colley review package was initially tested through its application to two individual reports before reviewing the rest of the sample.

Instead of the double-reviewer method recommended in Lee *et al.* (1999), an inter-comparison approach was adopted (Pöder and Lukki, 2011), by two of the authors jointly reviewing a number of reports together at the beginning to ensure consistency for further reviews following the example of Canelas *et al.* (2005). Having become familiar with the use of the adapted review method in the first two reports, the remainder of the EIRs were then reviewed by one reviewer. Reliance on a single reviewer can be seen as a limitation of the methodology, especially in light of Peterson's (2010) finding that group assessment was more critical than individual assessment when reviewing EIR quality. However, in the context of exploring changes from ECA to NEMA, any potential bias caused by this approach is unlikely to obscure any report quality trends.

4. Results and analysis

In terms of presenting and analysing the results, the individual EIR assessment grades are combined into two groups i.e. 1997 and 2006. This was to enable any patterns between the 1997 and 2006 reports to become evident when making comparisons between them (no attempt was made to apply statistical testing).

In order to aid interpretation of the grades, the assessment symbols A (well performed), B (satisfactory and complete), and C (just satisfactory), were grouped together. As these symbols reflect the completion of tasks to a satisfactory standard, this grouping can be regarded as providing sufficient information for a decision, i.e. overall satisfactory quality. In order to identify strengths and weaknesses, the A-B grades (good performance - strength) and E-F grades (poor performance - weakness) were also calculated and are presented in Table 4 together with percentages (McGrath and Bond, 1997; Lee *et al.*, 1999).

Table 4: Overall grades, review areas and review categories - 1997 to 2006

EIA system	1997 [n= 11]			2006 [n= 15]		
	A-C (%)	A-B (%)	E-F (%)	A-C (%)	A-B (%)	E-F (%)
Overall grade	10 (91)	2 (18)	0	12 (80)	1 (7)	0
RA 1 Description of development, local environment & baseline conditions	10 (91)	5 (45)	0	12 (80)	2 (13)	0
1.1 Description of the development	11 (100)	5 (45)	0	15 (100)	4 (27)	0
1.2 Site description	9 (82)	4 (36)	0	8 (53)	1 (7)	3 (20)
1.3 Wastes	1 (9)	1 (9)	5 (45)	8 (53)	3 (20)	40
1.4 Environment description	10 (91)	7 (64)	0	14 (93)	10 (67)	0
1.5 Baseline conditions	11 (100)	7 (64)	0	15 (100)	10 (67)	0
RA 2 Identification and evaluation of key impacts	4 (36)	0	0	5 (33)	0	2 (13)
2.1 Definition of impacts	5 (45)	3 (27)	0	7 (47)	0	1 (7)
2.2 Identification of impacts	4 (36)	1 (9)	5 (45)	4 (27)	2 (13)	8 (53)
2.3 Scoping	10 (91)	6 (55)	0	12 (80)	7 (47)	7
2.4 Prediction of impact magnitude	0	0	10 (91)	0	0	13 (87)
2.5 Assessment of impact significance	7 (64)	2 (18)	1 (9)	8 (53)	2 (13)	3 (20)
RA 3 Alternatives and mitigation	6 (55)	1 (9)	1 (9)	8 (53)	2 (13)	1 (7)
3.1 Alternatives	7 (64)	1 (9)	0	10 (67)	7 (47)	3 (20)
3.2 Scope and effectiveness of mitigation measures	9 (82)	7 (64)	0	13 (87)	8 (53)	0
3.3 Commitment to mitigation	2 (18)	2 (18)	4 (36)	5 (33)	2 (13)	5 (33)
RA 4 Communication of results	11 (100)	7 (64)	0	15 (100)	6 (40)	0
4.1 Layout of the report	11 (100)	8 (73)	3 (27)	12 (80)	9 (60)	1 (7)
4.2 Presentation	11 (100)	9 (82)	0	14 (93)	11 (73)	0
4.3 Emphasis	11 (100)	9 (82)	0	15 (100)	10 (67)	0
4.4 Non-technical summary	9 (82)	9 (82)	2 (18)	15 (100)	9 (60)	0

Key

Weaker performance in 2006	Improved performance in 2006	No change in performance
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EIA report quality of the sample

The overall quality of the EIRs prepared under both systems is reasonably high, with a slight decrease from 1997 to 2006 (Fig. 2), although none of the reports could be described as performing well overall (A grade). Contrary to the initial hypothesis, slightly weaker performance in 2006 is evident in the grades at all levels of the review hierarchy. However, upon closer scrutiny of the results a more nuanced pattern emerges, indicative of the complexity of the results; therefore a more detailed consideration of these findings follows.

Review Area 1 (Project and Environmental Description) and Review Area 4 (Communication of Results) were addressed to a satisfactory degree and were the best performing review areas for both 1997 and 2006 reports. For Review Area 1, 91% of the 1997 reports were graded C or higher, compared to 80% of the 2006 reports. All reports were satisfactory (C or higher) in both systems for Review Area 4. Both Review Area 2 (Impact Identification and Evaluation) and Review Area 3 (Alternatives and Mitigation) had lower satisfactory grades in both systems, potentially reflecting the greater complexity of the tasks required for the prediction of impacts and formulation of relevant mitigation measures. In all cases the review area grades were slightly lower for the 2006 reports.

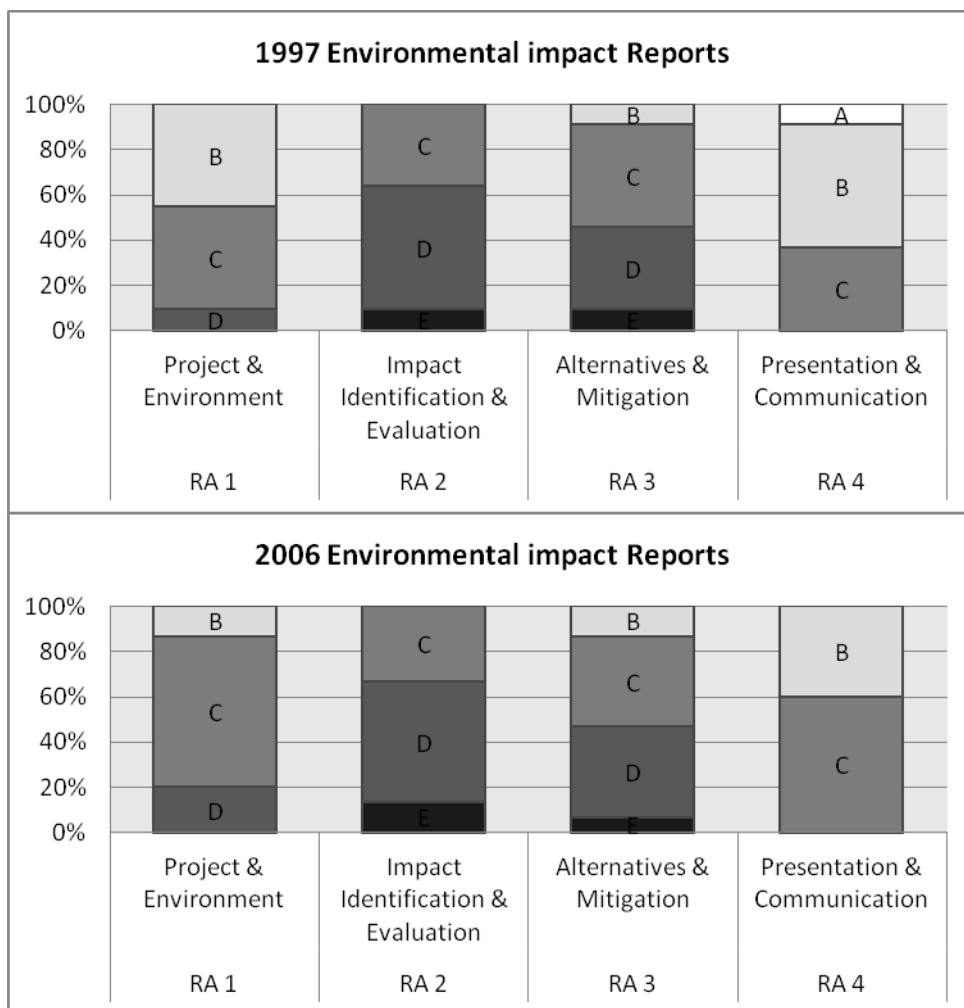


Figure 2: Grades for Review Areas - 1997 and 2006 EIRs

A – well performed, B – generally satisfactory, C – just satisfactory, D – just unsatisfactory, E – not satisfactory, and F – very unsatisfactory.

Review Area 1 – description of the development and the environment

In both systems, the best performance ratings were recorded for review topics relating to descriptions of the development, the baseline conditions, the site and the surrounding environment. Particular problem areas related to waste, including the methods of obtaining the quantity, treatment and disposal, as well as disposal routes to the environment.

The weakest performance was observed for the nature of production processes, raw materials, the duration of project phases, and the estimated number of workers and/or visitors, although the latter two were somewhat improved in 2006.

Review Area 2 – identification and evaluation of key impacts.

In both systems, this is the area of weakest performance in the sample, with less than half of reports graded as satisfactory, making it the least well-performed review area overall. The main problem areas for both systems related to the definition and identification of impacts (2.2)², and the prediction of impact magnitude (2.4), where these categories had the worst grades in the sub-categories relating to information on impacts. In addition, the methods used to identify impacts and to predict magnitude, and the data to estimate the magnitude of the main impacts were poorly performed.

Review Area 3 – Alternatives and mitigation

In both systems over half of the reports were rated as satisfactory (A-C). The better grades were allocated to review topics dealing with alternative sites and the consideration of mitigation measures for significant adverse impacts. The worst grades were allocated to the commitment to mitigation and monitoring arrangements. However, these are some of the few areas where, although weak overall, the performance of the 2006 system showed marginal improvement from the 1997 system. As the role of EIA is to prevent or minimise environmental degradation, it is disturbing that this fundamental aspect of EIA is not being addressed in the spirit of the process.

Review Area 4 – Communication of results

This was the best performed review area in both systems with all of the reports graded C or above, but the overall trend of slightly weaker performance under the 2006 system continues. Despite being the strongest review area compared to the previous three, less than half of the review area grades can be regarded as well-performed (A-B).

Areas where improvement took place

Despite an overall trend of poorer quality EIRs under the 2006 regulations compared to those of 1996, a scrutiny of the grades at the lower levels of the review hierarchy, reveals some areas of improvement (increase in % A-C) from 1997 to 2006. At the category level an increase in the percentage of satisfactory grades (A-C) from 1997 to 2006 was observed for:

- Description of wastes (1.3) where satisfactory grades rose from 9% to 53%.

² The number in parentheses refers to number of the topic in the review package.

- Commitment to mitigation measures (3.3) improved from 18% to 33% satisfactory grades.
- The non-technical summary (4.4) improved from 82% to 100% satisfactory grades, despite not being required under the 1997 regulations.

At sub-category level some of the biggest improvements in satisfactory (A-C) grades from 1997 to 2006 were:

- Description of the nature of production processes showed marked improvement in the 2006 EIRs moving from 0% to 27% satisfactory.
- Description of the nature and quantity of raw materials increased from 36% to 60% satisfactory grades.
- Identification of applicant and the details of EAP that carried out the assessment increased in terms of satisfactory grades from 73% to 80% and 55% to 67% respectively.
- The quality of description of wastes increased in all three the sub-categories (1.3.1, 1.3.2 and 1.3.3), by respectively 45% to 53%, 16% to 47% and 9% to 27%, although the description of the methods of obtaining the quantity of waste (27% satisfactory, 2006) remains very unsatisfactory.
- The description of the important components of the affected environment increased in satisfactory grades from 82 % to 93%.
- The description of the impacts arising from non-standard operating conditions and from deviation from baseline conditions also improved (9% to 27% and 18% to 33% respectively), although the grades are still very unsatisfactory overall.
- The consideration of mitigation of all significant adverse impacts changed from 91% to 100% satisfactory grades.

It appears that these improvements may be due to implementation of the more specific requirements in the new regulations as there is a strong link between the focus of the review categories and sub-categories and the extra EIR provisions of the 2006 regulations noted in Table 1, for example the formal requirement for a non-technical summary in the 2006 regulations. Nevertheless, there are other topics which are similarly explicit in their requirements in the 2006 regulations, which did not improve.

Key findings

The results obtained for the assessment grades awarded to the EIRs in both the 1997 and 2006 systems show that generally good quality reports are submitted with regard to their layout, presentation and emphasis, although the slightly lower grades of the reports in the 2006 system indicate that the more detailed requirements have not resulted in a clear improvement in quality, thus leaving considerable scope for progress in a range of aspects relating to assessment. Whilst there *were* improvements in some topics at the lower levels of the hierarchy, as shown above, these were insufficient in number to lead to a broader ‘percolation’ to the higher levels. In order to provide perspective in terms of changes in report quality following the new regulations, the A-B grades (good performance) and E-F grades (poor

performance) displayed in Table 4 were used to highlight strengths and weaknesses as follows:

- Strengths: Review topics with more than 50% A - B grades
- Weaknesses: Review topics with more than 50% E and F grades.

The key strengths and weaknesses under the two sets of regulations are shown in Table 5.

Table 5: Strengths and weaknesses in the 1997 and 2006 EIA reports

	1997	2006
Strengths (A-B grades >50%)		
1.4 Environmental description	64%	67%
1.5 Baseline conditions	64%	67%
2.3 Scoping	55%	
3.2 Scope and effectiveness of mitigation measures	64%	53%
4.1 Layout of the report	73%	60%
4.2 Presentation	82%	73%
4.3 Emphasis	82%	67%
4.4 Non-technical summary	82%	60%
Weaknesses (E-F grades >50%)		
2.2 Identification of impacts		53%
2.4 Prediction of impact magnitude	91%	87%

It is evident from the distribution of A-B grades in the 1997 reports that there are areas of strength in all the Review Areas, although Review Area 2 stands out as one of the weakest areas. The weakest area (E-F grades) under both systems appears to be the prediction of impact magnitude (2.4).

The grades for the reports from both the 1997 and 2006 systems confirm better performance in Review Areas 1 and 4 relating to the description of the activity and environment, and the presentation of the report, than the more analytical tasks required in Review Areas 2 and 3, such as impact identification, alternatives and mitigation measures. Scoping performed slightly weaker under the new regulations of the 2006 EIA system. The poorest grades in both the 1997 and 2006 EIA systems were allocated to monitoring arrangements, indicating considerable room for improvement in the performance of that part of the EIA system.

5. Conclusion and way forward

At the outset of this research it was hypothesised that EIR quality would improve under the 2006 EIA regulations in South Africa relative to those of 1997, based in part on experience in the UK and Europe that found that the overall quality of EIRs generally improves with time (Badr *et al.*, 2004; Barker and Wood, 1999; European Commission, 1996; Fuller, 1999; Canelas *et al.*, 2005; Glasson *et al.*, 1997; Morrison-Saunders *et al.*, 1999).

Consequently it is a somewhat disturbing conclusion from this investigation that the quality of the EIA reports has not improved following implementation of the new regulations in 2006 and has at best reached a modest plateau and at worst shown a decline.

Questions that arise from this finding are:

- What is revealed about EIA practice in South Africa after the promulgation of the 2006 EIA regulations?; and
- What can be done about it to reverse this pattern into the future?

The results from this evaluation of EIR quality for both the 1997 and the 2006 systems are similar to those from other South African studies on EIA quality (Sandham and Pretorius, 2008; Sandham, *et al.*, 2008a, b; Sandham *et al.*, 2010) as well as internationally (European Commission, 1996; Barker and Wood, 1999; Lee, 2000; Pölönen *et al.*, 2010) with lower grades in the more analytical areas (Review Areas 2 and 3) compared to the higher grades in the more descriptive and presentational areas (Review Areas 1 and 4).

However, the aim of this study was to evaluate to what extent the new EIA regulations have influenced EIR quality and especially whether the arguably more comprehensive, detailed and wide-ranging requirements of the 2006 EIA regulations resulted in better quality reports. The evidence shows that presentation of EIRs (Review Area 4) remains largely satisfactory, and the more 'difficult' areas of impact identification and evaluation (Review Area 2) and alternatives and mitigation (Review Area 3) continue to be the weaker aspects of the EIRs showing little change in quality.

The reasons for this failure to move forward are unclear and require further work to engage with the various role players to explore their views on this situation.

However, given that report quality was slightly better in the 1997 system, it suggests that more detailed regulations do not ensure improved practice. Perhaps good practice needs flexibility rather than over-detailed regulation and it is interesting to note that this is a strong sentiment that has emerged in recent reviews of the South African EIA process (e.g. DEAT, 2008; Kidd and Retief, 2009; DEA, 2011)³. Another issue then arises as to the relationship between regulatory change and practice change. Based on the evidence presented here, it is not an encouraging one, since regulatory change has not brought about improvement in EIR quality.

Since changes to regulation have not resulted in better EIRs, improvements in quality must therefore be sought by other channels. One such opportunity could lie with the accreditation and training of EAPs and other role players such as project managers and specialists, improved guidance on good practice and continuing research, something the EIA community is currently working towards under the auspices of the Southern African affiliate of the International Association for Impact Assessment. Properly conducted, these measures are perhaps more likely to increase the standard of practice in an EIA system (Wood, 2003). Currently, despite significant progress towards a registration body for EAPs, there is no mandatory accreditation of EAPs,

³ Nevertheless, further revision of the regulations occurred in 2010, albeit much less extensive than the 2006 changes (South Africa, 2010).

nor any official criteria for qualifying as an EAP, and therefore this is still a weakness within the South African EIA legislation.

While there are currently strong calls to reform the legal arrangements for EIA in South Africa (e.g. DEA, 2011), this research shows that such change does not guarantee that improvements in EIR report quality (and by extrapolation through to EIA decision making and implementation) will result. The continued emphasis on legal reform in South Africa and elsewhere in the world as the basis to improve the quality of practice is regarded as overstated. The general challenge posed to Environmental Assessment to deliver more sustainable outcomes seems to be hampered by overly complex and rigid legislative regimes. It is therefore suggested that practitioners who are keen to improve the effectiveness of EIA should explore other means. One promising avenue particularly relevant in a South African context would be improving the quality of training and professional accreditation of practitioners and then allowing flexibility in the EIA system for these practitioners to introduce innovation and creativity in decision making.

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References

- ANDROULIDAKIS, I. & KARAKASSIS, I. Evaluation of the EIA system performance in Greece, using quality indicators, *Environmental Impact Assessment Review*, 2005: 26:242-25.
- BADR EA, CASHMORE M, COBB D. The Consideration of Impacts upon the Aquatic Environment in Environmental Impact Statements in England and Wales. *Journal of Environmental Assessment Policy & Management* 2004; 6:19-49
- BARKER, A., & WOOD, C. An evaluation of EIA system performance in eight EU countries, *Environmental Impact Assessment Review*, 1999: 18(4): 387-404.
- CANELAS, L., ALMANSA, P., MERCHAN, M. & CIFUENTES, P. Quality of environmental impact statements in Portugal and Spain, *Environmental Impact Assessment Review*, 2005: 25: 217-225.
- CASHMORE, M.; GWILLIAM, R.; MORGAN, R.; COBB, D.; BOND, A., The interminable issue of effectiveness: substantive purposes, outcomes and research challenges in the advancement of environmental impact assessment theory. *Impact Assess Project Appraisal* 2004: 22 (4), 295-310, December 2004.
- CHRISTENSEN, P., KØRNØV, L AND NIELSEN & HOLM, E. EIA as Regulation: Does it Work? *Journal of environmental Planning and Management*, 2005: 48(3): 393-412.
- DEA. *Environmental Impact Assessment and Management Strategy – Theme: Governance and Administration, Final Report, Sub-Theme1: Procedures and Organisational Structures*. (prepared by EnAct International for Department of Environmental Affairs, Pretoria), August 2011.
- DEAT. *Guideline Document. EIA Regulations: Implementation of Sections 21, 22 and 26 of the Environment Conservation Act. April 1998*. Department of Environmental Affairs and Tourism (DEAT), Pretoria. 1998,

- DEAT. *Review of the Effectiveness and Efficiency of the Environmental Impact Assessment (EIA) system in South Africa*, Department of Environmental Affairs and Tourism, Pretoria. 2008
- EUROPEAN COMMISSION. Evaluation of the performance of the EIA process: Wood, C., Barker, A., Jones, Hughes, J. Volume 1: Main report, European Commission, Brussels; 1996.
- EUROPEAN COMMISSION, Collection of information and data to support the Impact Assessment study of the review of the EIA Directive – Final Report, European Commission, London. 2010.
- FULLER, K. Quality and quality control in EIA, Chapter 4, pp55-82, in Petts, J. (ed) *Handbook of Environmental Impact Assessment*, Volume 2, Blackwell, Oxford. 1999.
- GLASSON, J., THERIVEL, R., WESTON, J., WILSON, E. and FROST, R. EIA - Learning from Experience: Changes in the Quality of Environmental Impact Statements for UK Planning Projects, *Journal of Environmental Planning and Management*, 1997: 40(4), 451-464.
- GLASSON, J., THERIVEL, R. & CHADWICK, A. Introduction to Environmental Impact Assessment, 3rd ed., London: Routledge. 342 pp. 2005.
- GLAZEWSKI, J. Environmental law in South Africa, 2nd edition, Durban: Butterworths, pp 133-161. 2005.
- GRAY, I.M. & EDWARDS-JONES, G. A review of the quality of environmental impact assessments in the Scottish forest sector, *Forestry*, 1999: 72(1): 1-10.
- HEINMA, K & PÖDER, T. Effectiveness of Environmental Impact Assessment system in Estonia. *Environmental Impact Assessment Review*, 2010: 30: 272-277.
- JALAVA, K., PASANEN, S., SAALASTI, M. & KUITUNEN, M. Quality of environmental Impact Assessment: Finnish EISs and the opinions of EIA professionals. *Impact Assessment and Project Appraisal*, 2010: 28(1): 15-27.
- JAY, S., JONES, C., SLINN, P. & WOOD, C. Environmental Impact Assessment: Retrospect and Prospect. *Environmental Impact Assessment Review*, 2007: 27(4): 287–300.
- KIDD, M ; RETIEF F, "Environmental Assessment", in H Strydom and N King (editors), *Fuggle and Rabie's Environmental Management in South Africa* (Juta Publishing, Cape Town) pages 971-1047. 2009
- KRUOPIENĖ, J., ŽIDONIENĖ, S & DVORIONIENĖ, J. Environmental Impact Assessment in Lithuania, *Environmental Impact Assessment Review*, 2009: 29(5): 305-309.
- LEE, N. Reviewing the Quality of Environmental Assessments. In: *Environmental Assessment in Developing and Transitional Countries*, (eds) N. Lee & C. George, Chichester: Wiley & Sons, p137-148. 2000.
- LEE, N., COLLEY, R., BONDE, J., SIMPSON, J., Reviewing the quality of environmental statements and environmental appraisals. Occ. Paper No 55. EIA Centre, Dept of Plan. and Landscape, University of Manchester, 1999.
- MBHELE, P.M. The quality of EIA reports for housing developments in the Nkangala district of the Mpumalanga province, South Africa. Mini-dissertation submitted in partial fulfilment of the requirements for the degree of Masters in Environmental Management at the North-West University, Potchefstroom. 80p. 2009.
- MCGRATH C, BOND A. The quality of environmental impact statements: a review of those submitted in Cork, Eire 1988–1993. *Proj Appraisal* 1997;12(1):43–52.

- MORRISON-SAUNDERS, A., ANNANDALE, D. and CAPPELLUTI, J. Practitioner perspectives on what influences EIA quality *Impact Assessment and Project Appraisal*, 2001: 19(4): 321-325
- PARDO, M. Environmental Impact Assessment: myth or reality? Lessons from Spain. *Environmental Impact Assessment Review*, 1997: 17(2): 123-142.
- PETERSON, K. Quality of environmental impact statements and variability of scrutiny by reviewers. *Environmental Impact Assessment Review*, 2010: 30: 169-176.
- PINHO, P., MAIA, R. & MONTERROSA, A. The quality of Portuguese Environmental Impact Studies: The case of small hydropower projects, *Environmental Impact Assessment Review*, 2007: 26(3): 189-205.
- PÖDER, T. & LUKKI, T. A critical review of checklist-based evaluation of environmental impact statements. *Impact Assessment and Project Appraisal*, 2011: 29(1): 27-36.
- PÖLÖNEN, I., HOKKANEN, P & JALAVA, K. The effectiveness van the Finnish EIA system – What works, what doesn't and what could be improved? *Environmental Impact Assessment Review*, 2010: 31(2): 120-128.
- RETIEF, F., CHABALALA, B. . The cost of environmental Impact Assessment (EIA) in South Africa. *Journal of Environmental Assessment Policy and Management*, 2009: 11(1): 51-68
- SADLER, B. On Evaluating the Success of EIA and SEA. In: A Morrison-Saunders and J Arts (eds), *Assessment Impact - Handbook of EIA and SEA Follow-up*, London:Earthscan, 2004: 249-253.
- SANDHAM, L.A., CARROLL, T.H., RETIEF, F.P. The contribution of Environmental Impact Assessment (EIA) to decision making for biological pest control in South Africa – The case of *Lantana camara*, 2010: *Biological Control*, 55(2): 141-149.
- SANDHAM, L.A., HOFFMANN, A.R. & RETIEF, F.P. . Reflections on the quality of mining EIA reports in South Africa. *The Journal of the Southern African Institute of Mining and Metallurgy*. 2008a: 108: 701-706
- SANDHAM, L.A., MOLOTO, M.J. & RETIEF, F.P. The quality of Environmental Impact Reports for projects with the potential of affecting wetlands. *Water SA*, 2008b: 34(2): 155-162.
- SANDHAM, L.A. & PRETORIUS, H.M. A review of EIA report quality in the North West Province of South Africa. *Environmental Impact Assessment Review*, 2008: 28(4-5):229-240.
- SANDHAM, L.A., SIPHUGU , M.V. & TSHIVHANDEKANO, T. R. Aspects of Environmental Impact Assessment (EIA) practice in the Limpopo Province – South Africa, *AJEAM-RAGEE*, 2005: 10: 50-65.
- SCESD Statutory Review of the Canadian Environmental Assessment Act, Standing Committee on Environment and Sustainable Development, Parliament of Canada, Ottawa. 2011
- SOUTH AFRICA. Environment Conservation Act, Act no. 73 of 1989, Pretoria: Government Printer. 1989.
- SOUTH AFRICA. Regulations regarding activities identified under Section 21(1) of the Environmental Conservation Act, 1989 (Act No. 73 of 1989), *Government Gazette*, 18261, September 5 (R 1183). 1997a.
- SOUTH AFRICA. The identification under Section 21 of activities which may have a substantial detrimental effect on the environment, *Government Gazette*, 18261, September 5 (R 1182). 1997b.

- SOUTH AFRICA. Designation of the competent authority to issue authorisations for undertaking activities listed under GN R.1182. *Government Gazette*, 18261, September 5 (Regulation 1184). 1997c.
- SOUTH AFRICA. National Environmental Management Act, 107 of 1998, Government Printer, Pretoria. 1998
- SOUTH AFRICA. List of activities and competent authorities identified in terms of sections 24 and 24d of the National Environmental Management Act, 1998. *Government Gazette*, 28753, April 21. (Notice R 386). 2006a.
- SOUTH AFRICA. List of activities and competent authorities identified in terms of sections 24 and 24d of the National Environmental Management Act, 1998. *Government Gazette*, 28753, April 21. (Notice R 387). 2006b.
- SOUTH AFRICA. Regulations in term of Chapter 5 of the National Environmental Management Act, 1998. *Government Gazette*, 28753, April 21. (Notice R 385). 2006c.
- SOUTH AFRICA. Environmental Assessment Regulations. *Government Gazette*, 33306, 18 June. (Government Notice R 543). 2010.
- TZOOMIS, K. Comparing the quality of environmental impact statements by agencies in the United States since 1998 to 2004, *Environmental Impact Assessment Review*, 2007: 27(1): 26-40.
- VAN DER VYVER, F. The quality of Environmental Impact Reports for Explosive Industry Projects in South Africa. Mini-dissertation submitted in partial fulfilment for the degree of Masters in Environmental Management at the North-West University, Potchefstroom. 68p. 2008.
- VAN HEERDEN, A.J. A comparative analysis of EIA report quality before and after 2006 in South Africa. Dissertation for the degree Master of Science in Geography and Environmental Management, North-West University, Potchefstroom. 89p. 2010.
- WOOD, C. Pastiche or pastiche? Environmental Impact Assessment in South Africa, *South African Geographical Journal*. 1999: 81(1): 52 – 59.
- WOOD, C. Environmental Impact Assessment: A Comparative Review. Second Edition, Harlow, England: Pearson. 504 pp. 2003.
- ZEREMARIAM, T. & QUINN, N. An evaluation of environmental impact assessment in Eritrea. *Impact Assessment and Project Appraisal*, 2007: 25(1): 53-63.