Integration of Environmental Impact Assessment and Environmental Management Systems in Shell's EIA Rectification Process in the Gauteng Province in South Africa

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Abstract

There are tensions between the state and business in the regulation of environmental matters. Some problems experienced in the application of Environmental Impact Assessment (EIA) in South Africa between the state administered environmental legislation and a corporate representative of the business world are exemplified in Shell's EIA Rectification Process for fuel storage tanks in the Gauteng Province, South Africa. This paper highlights some of these problems and, in response, proposes the implementation of an Environmental Management System (EMS) as a tool for the ongoing management of the fuel storage tanks after the rectification process. Practical and theoretical perspectives of both EIAs and EMSs are discussed, and an EMS based on the South African National Standard (SANS) ISO 14001 framework is proposed to manage the tanks. A brief background of the Rectification Process is given, putting into perspective the need for a comprehensive system for improved tank management.

Key words: Environmental Impact Assessment, Environmental Management Systems, Rectification, South Africa

Introduction

Environmental Impact assessment (EIA) is the primary environmental management tool that is applied in South Africa. Other environmental management tools, such as Environmental Management Systems (EMSs) are also utilised, although many of these other tools are not as regulated as EIA. It is argued that the near exclusive use of EIA in addressing environmental management is inadequate, most notably during the implementation phase of projects. In terms

of the Environmental Impact Assessment (EIA) Regulations under the Environment Conservation Act (Act No. 73 of 1989), no provision was made for undertaking retrospective EIAs to deal with applicants/developers who undertook activities without the required authorisation (DEAT, 1997).

In order to deal with this gap in the legislation the National Environmental Management Second Amendment Act, No. 8 of 2004 came into force on 7 January 2005. In terms of Section 7, the transitional provision of this Act, unauthorized commencement or continuation of activities identified in terms of the Environment Conservation Act could be rectified by means of an application, in terms of Section 24(g), to the relevant provincial environmental authority. The so-called 'amnesty' period was limited to 6 months from the date that the Amendment Act came into force and, accordingly, lapsed on 6 July 2005. During this period a number of amnesty applications were submitted to the various provincial environmental departments.

Shell submitted 176 amnesty applications to the Gauteng Department of Agriculture, Conservation and Environment (GDACE) for the installation of fuel storage tanks at various sites for which an EIA application was not originally submitted in terms of the Environment Conservation Act. The Rectification Process was undertaken by independent environmental consultants, ERM Southern Africa, who had been appointed by Shell SA Marketing (Pty) Ltd, hereafter referred to as Shell, the owners of the fuel storage tanks (Day, 2007).

There is tension within the practice of environmental management. Tension is defined as a situation in which existing different needs or interests cause difficulties (Oxford English Dictionary, 2003). In Environmental Management (EM) tension has been acknowledged in various aspects of this dynamic field. This tension within EM is embedded in the very origins of the field. The state-centric origins of EM, biasing practice towards the application of positivist science, are seen as the crux of the tension. The distinguishing characteristic of the positivist view of planning and decision making is that the best course of action is identified by the analyst, based on objective facts (Hill, 2004). According to Faludi (1986), this view of decision making can be described as 'technocratic'. Environmental Management is viewed as having "*developed as a techno-centric problem solving initiative providing practical assistance to state officials involved in Environmental Management*" (Bryant and Wilson, 1998: p. 321).

The state, in its role as a steward of the environment, centralised the practice of EM while society, within which it functions, is decentralized. This biased the

development of EM leading to the neglect of other vital processes such as the need to accommodate political, economic and cultural forces in the practice of EM (Bryant and Wilson, 1998). Such neglect affected most non-state actors including the private business community. Non-state entities were neglected on the premise that the public was not qualified to make judgements or provide meaningful contribution to the planning and decision making process (Sowman *et al.*, 1995). This state-centric practice of EM has been criticised as self serving, synonymous with the development of large bureaucracies. The practice is furthermore associated with a 'top-down' approach to solving environmental problems by the state (Bryant and Wilson, 1998).

In South Africa, the apartheid system encouraged a state-centred approach in EM, which was characterised by an expert led and elitist approach (Sowman *et al.*, 1992, cited in Sowman *et al.*, 1995). The focus on EM as an activity conducted by the state has resulted in much tension and resentment of EM by the very citizens for whom the state claims to be managing the environment. Because society is pluralistic, the state centralized approach can be a source conflict within EM.

Two Environmental Management tools epitomise the tension within the practice of EM: Environmental Impact Assessment (EIA), which is state regulated, and Environmental Management Systems (EMS), which is a self regulatory and voluntary tool. These two EM tools encapsulate divergent ways of understanding and managing the natural environment, by state and non-state actors. The environmental attitude of the state, reflected in EIAs, adheres to techno-centric attitudes informed by western positivist science, while non-state actors frequently adopt eco-centric approaches linked to long standing 'holistic' visions of human environmental interaction (Bryant and Wilson, 1998). Recurrent conflict over how to mange the environment thus often ensues from such attitudinal differences (Bryant and Wilson, 1998 citing Shiva, 1991; Peluso, 1992; Mitchell, 1995; and Bryant, 1997).

Environmental Management from the perspective of the non-state actor is seen negatively as largely a matter of formulation and implementation of environmental laws, policies and regulations by the state, (Bryant and Wilson, 1998). The state approach, which is focused on the environmental problem at hand, fails to integrate discrete problems into the wider, political, economic and social context (Bryant and Wilson, 1998, citing Blaikie and Brookfield, 1987).

The state-centred EM approach on which EIA is based is described as 'prescriptive

or command and control', in which the government sets out specific requirements as legal regulations (Anonymous, 1997). This makes it relatively easy for government to determine, via inspection procedures, whether an operator is meeting requirements. This regulatory approach is in contrast with a self regulatory 'performance based' approach such as EMS which places a greater emphasis on setting a performance objective or goal to be reached by industry (Anonymous, 1997).

It is worth acknowledging that tension or conflict is not inherently negative, a premise that is explored further in this paper by focusing on two environmental management tools, EIA and EMS that have seemly conflicting approaches. The weaknesses within EIA are explored before the complementary strengths of both approaches are discussed. In the remainder of this paper these tools are tested against the proposition that it is feasible for both tools to operate in unison.

The paper motivates for the integration of EIA and EMS, with reference to a case study of the management of Shell Marketing (Pty) Ltd's fuel storage tank installations for which an EIA rectification process was conducted in Gauteng Province.The paper is divided into two parts. The first part gives a brief background on Shell's EIA rectification process. The tensions around the use of different EM tools are discussed: while the public sector places more emphasis on the use of regulatory instruments like EIA, the private sector often argues for less state intervention and a greater use of voluntary tools such as EMS. A discussion on general and specific shortcomings within EIA concludes part one. The second part of the paper explores the potential for the integration of EIA and EMS, and motivates for an ISO 14001 based EMS to manage Shell's tank installation after the rectification process. The paper concludes by emphasising the benefits of the integration of EIA and EMS in environmental management.

EIA and some shortcomings within its practice

EIA is a legislated tool used to assess the positive and negative environmental impacts of a proposed project and alternative options. EIA proposes measures to mitigate potential negative impacts and enhance the positive impacts. These assist authorities in deciding on environmentally sustainable proposals (DEAT, 2004)

Environmental Impact Assessment (EIA) is defined as, inter alia, a planning tool where assessments are done to forecast and evaluate the impacts of proposed

projects and alternatives (Ortolano and Shepherd, 1995). The ultimate purpose of EIA is not just to assess impacts, but also to improve the quality of decisions (Ortolano and Shepherd, 1995). The essence of EIA is to facilitate sound decision-making in which environmental considerations are explicitly and systematically taken into account in the planning and development process (Glazewski, 2005).

The recognition of the importance of EIA is evident in its extensive utilisation in more than 100 countries in less than 40 years since its inception. An appreciation of the usefulness of EIA has been within an international context, namely, in article 14 of the Convention of Biodiversity (CBD) which explicitly requires parties to apply EIA, singling it out as a potential implementation tool (Mandelik *et al*., 2005).

In is noted the EIA is a mature instrument and has been applied worldwide in the practice of environmental management (de Boer, 2005). For some time EIA was the first and only integrative instrument in the field of Environmental Management, however this is not the case any more as the anticipated benefits of EIA are actually not being fully realized. This pioneering tool is flawed with several shortcomings having been identified. Studies of the quality of ecological component of EIAs, for instance, have revealed very low standards throughout the EIA process. Mandelik *et al*. (2005) have identified a number of shortcomings which include a failure to address cumulative, indirect and complex effects impacts. Table 1 below shows the shortcomings identified in EIA.

Table 1: Summary of main findings on major shortcomings of ecological impact assessment in different EIA systems (Source: adapted from Mandelik *et al*., 2005)

Baseline Description

- Failure to address appropriate spatial scales
- Failure to address all components of biodiversity
- Inadequate quantitative data
- Low standard of field survey (reluctance to address spatial and temporal variations)

Impact Prediction

- Omitting key impacts
- Reluctance to quantify impacts
- Reluctance to evaluate the significance of impacts
- Failure to address cumulative, indirect and complex effects impacts

Mitigation and Monitoring

- Severe impacts left un-mitigated
- Reluctance to evaluate the efficacy of proposed measure
- Reluctance to mention the need for or propose adequate monitoring programmes.

These identified shortcomings within EIA reduce the usefulness of the tool and inevitably its ability to achieve environmental sustainability. The attainment of environmental sustainability requires a holistic approach to managing the environment. With the above noted shortcomings, sustainability becomes ever illusive using EIA as the primary environmental management tool.

Problems within EIA with reference to Shell's EIA rectification in Gauteng

During Shell's EIA rectification process several shortcoming were discovered. It was noted that the rectification process was project based, concerned with local issues and with no regard to cumulative impacts. The goals set by GDACE are regarded as narrow with regard to the non inclusion of cumulative impact assessment and also the non inclusion of monitoring of impacts after the rectification process. It is an inherent flaw within EIA in that it does not always give adequate consideration to the cumulative impacts of more than one project. Furthermore, it does not address the additive impacts of developments that do not require EIA (MacLeod, 1996).

The EIA rectification process was guided by a checklist which had to be strictly adhered to. This reduced the process into a classic *pro forma* exercise for Shell to just simply satisfy legal requirements with no lasting management system post the rectification process mandated. In this way, rectification EIA fails to realize the ultimate purpose of EIA which is not to just to assess impacts but to improve the quality of decisions (Mandelik *et al.*, 2005).

Findings from the Shell's EIA rectification process showed that there was inadequate management of the tank installations. The site inspections conducted during the EIA showed some the findings below:

- 44% of tank installations are in a dilapidated condition;
- 28% of sites have evidence of product spillages and leaks; and
- 92% of sites do not have any pollution prevention measures.

Addressing these findings needs to be a continuous process that goes beyond the

EIA rectification process. However EIA only generates this environmental information without offering a long lasting solution to address these findings. EIA has no provisions for auditing or monitoring after the EIA process is complete. These findings maybe addressed immediately but in time these negative findings will recur without a permanent strategy in place to address them.

Case studies suggest that EIAs are not yielding all the benefits they should because the process is undertaken too late and project proponents are concerned primary with mandatory administrative requirements (Mandelik *et al.*, 2005). This shortcoming is exemplified in the Shell EIA rectification process.

The limitations on EIA detailed above raise serious questions about whether EIA is the best way to examine and manage Shell's fuel storage tanks. This paper does not intend to disqualify EIA as an outdated tool but to expose its shortcomings for the sake for finding solutions for improving the useful aspects of EIA.

Motivations for implementation of SANS ISO 14001 based EMS after Shell's EIA Rectification Process

The identified shortcomings inherent within EIA compromise its ability to achieve environmental sustainability after the project construction phase. A structured environmental management system based on the South African Bureau of Standards SANS ISO 14001 standard is proposed as a possible effective environmental management strategy post the rectification process. It was noted during the EIA rectification process that there was an inadequate management system for the fuel storage tanks.

Focus is given to specific sections of the SANS ISO 14001 standard; these sections are seen as pertinent to fuel storage tank management post the rectification process. The specific sections of the standard focused on are: implementation of the management system, training, non conformances, corrective and preventive action, monitoring and communication. These aspects of the standard are identified as the pertinent aspects within the standard for the environmentally sound management of Shell's fuel storage tanks. While Shell has recognised environmental policies and standards that it adheres to, these can be improved by a more formal adoption of the SANS ISO 14001 based standard with particular attention to relevant South African standards such as the South African National Standard (SANS 10131) Code on tank installations. Such standards highlight the benefits

of the adoption of an EMS, especially to customers on whose properties the Shell fuel storage tanks are situated.

Pertinent components of the SANS ISO 14001 standard to effective management of Shell's fuel storage tank

The SANS ISO 14001 EMS standard is probably the most visible EMS in existence within South Africa. The standard has 18 core sections providing logical guidelines for implementation (DEAT, 2004). The SANS ISO 14001 standard ensures that corporations succeed in translating their environmental policies into organizational behaviour. This success is vital for Shell, post the EIA rectification process, as an EMS avoids the problems afflicting the established approach that organisations take on environmental matters (Moxen and Strachen, 2000).

The lack of monitoring post the EIA makes the implementation of a system that offers continual management of the environment crucial. An EMS goes beyond the project activities of a particular organization, and has positive spill over effects that extend beyond the confines of an organisation: these effects are expected to increase in the medium and long-term perspective of the organisations operations (Lozano and Vallés, 2007).

Implementation of an effective environmental management system allows for better control of environmental impacts of operations. An Environmental Management System offers a proactive system that promotes continuous improvement and pollution prevention. The EMS specifications provide the tools for designing, implementation and monitoring a comprehensive system to manage environmental impacts (Hill, 2000).

Critical to this motivation for the implementation of SANS ISO 14001 EMS is the fact that the EMS goes beyond Shell as an entity, but also includes suppliers, contractors and most importantly customers. Recognizing that customers are an integral part in effective environmental management of the fuel storage tanks is vital. If implemented effectively, an EMS fosters a cultural shift towards environmental awareness (Henderson, 2007). This instils an environmentally conscious culture into the organization and importantly in this instance into Shell's customers. The SANS ISO 14001 EMS focuses on the development of organisational structures that clearly define roles and responsibilities for both Shell and its customers (Hill, 2000).

During the EIA rectification process, Shell distributed a comprehensive Environmental Management Plan (EMP) which covered and addressed most factors

that are important in managing the tanks in an environmentally sound manner. The EMP provides information on site selection, plus detailed and specific information on tank installation, access routes, tank maintenance, accidental spills or leakages, response and reporting, site clean-up and remediation, and site decommissioning. The EMP also includes site sensitivity considerations that provide an indication of potential environmental impacts from Shell's tank installations. The implementation of the EMS is seen as complementary to the comprehensive EMP and would also assist in mitigating the negative findings from the EIA rectification process.

The aspects of training and corrective action within the SANS ISO14001 standard are crucial in addressing the poor environmental conditions associated with some of the tanks. Training customers on proper management of the fuel storage tanks would ensure awareness and competence on environmental issues pertaining to tank management. This would also create an appreciation of the EMP that was distributed to the customers; the EMS training puts the EMP in to its true context within a structured management system. The EMP sets out the need to address identified negative environmental impacts associated with Shell's tank installations.

Key to an effective EMS is also the component of monitoring and measurement. This allows for the monitoring of key activities and tracking performance of the system. Periodic assessments are conducted for compliance with legal requirements, which would guide both Shell and their customers to behave in a way that would minimise the chance of litigation.

Integration of EIA and EMS for improved Environmental Management

In the multi-faceted practice of EM no one management tool can adequately and efficiently address all environmental management problems. The paper therefore advocates for a complementary use of both EIA and EMS for the sustainable management of Shell's fuel storage tanks. It is argued that the emphasis on EIA in environmental management is one sided (Hill, 2000).

The 'technocratic paradigm' of EM as 'command and control' should be evolving towards a focus that encourages voluntary agreements with industry. Key to this change is that whatever regulations and rules government introduces, enforcement should be done by creating an enabling environment for industry (UNEP, 1998).

Successful integration of government regulated EIA and the self regulatory approach of EMS by industry needs an enabling environment for both parties. Industry should be provided with framework conditions that accelerate the integration process. The

framework conditions enable industry to be is given an opportunity to discuss with government on the formulating of EM strategies in policy. This is essential because government needs effective regulatory action for improving environmental performance and ensure successful integration between industry and government EM strategies (UNEP, 1998). A 'negotiated compliance' approach is therefore advocated. It aims at obtaining compliance through the use of general and flexible guidelines and bargaining between regulators and the regulated (UNEP, 1998).The organisation for Economic Cooperation and Development (OECD) acknowledges that command and control has been successful, by and large, in arresting and significantly reducing pollution, but say it has failed to allow polluters the flexibility to develop and implement alternatives EM strategies (UNEP, 1998).

Combining EIA and EMS is not a new idea but one that has great potential towards the attainment of sustainability, as it strengthens environmental management. In Australia, current government policy relies heavily on voluntary arrangements, education and information as the main policy instruments through which to persuade business and industry to adopt better environmental management, with a push for voluntary environmental management systems (Gunningham, 2007). Such developments give a perspective on the benefits of combining of EIA and EMS.

Environmental Impact Assessment as a traditional approach has its pros, however as discussed earlier there has been a recognition of its limitations hence this advocacy for the integration with complementary environmental management strategies such as EMS. Such integration is seen as a paradigm shift in how natural resources management and environmental protection are being thought about and approached. This paradigm shift also includes a focus on industry's potential to develop its own solutions through adoption of voluntary arrangements for environmental management (Gunningham, 2007).

The adoption of a voluntary ISO 14001 standard by Shell for the management of its fuel storage tank has considerable potential to improve environmental and commercial outcomes. However there is good evidence to show that voluntary EMS can only make a valuable contribution when combined with a range of other policy instruments with an underpinning of regulation (Gunningham, 2007). This further emphasises the vision of a combined system of EIA and EMS in improving Environmental Management. The weaknesses of voluntary EMS can be compensated for through a complementary policy instrument such as EIA

(Gunningham, 2007). Table 2 below shows how EIA and EMS complement each other within South Africa showing that EIA lacks what EMS has, and vice versa.

Table 2: Summary of How EIA and EMS can complement each other in South Africa. (Source: adapted from DEAT, 2004 p 7-8)

Characteristics	Typical EIA process	ISO 14 001-consistent EMS
Goal	The goal of EIA is generally to ensure that environmental factors are considered during the planning process. These environmental factors will ultimately be incorporated into the EMS.	ISO 14001's goal is to ensue that environmental aspects and impacts are identified and managed. The continuous improvement requirement is used to reduce impacts over time. The environmental factors will become a part of the environmental aspects and impacts in the system.
Mandate	The EIA process is driven by a legal mandate to protect the environment with conditions of approval through the Record of Decision (RoD).	Conditions in the RoD become a part of the legal compliance structure within the EMS. Beyond this legal requirement substantive actions are expected to be taken, which lead to continual improvement in the environmental performance.
Planning function	A comprehensive environmental planning process is often followed, but it typically lacks an environmental quality system for ensuring that decisions are properly implemented. Legal compliance auditing will ultimately correct this.	A planning function requires a system for ensuring that decisions are appropriately implemented. However, it does not prescribe a detailed process for performing the planning function. An internal and external audit process will however, ensure quality checks and balances.
Public Participation	A detailed formal public participation process for identifying significant impacts and eliminating non-significant issues is generally specified. Public scoping is an important part of identifying and incorporating priorities.	A procedure (not public) is required to record and respond to external parties, but it does not include specific steps for public involvement. However, more organisations are voluntarily producing environmental and sustainability reports.
Other environmental requirements	Other environmental review processes and objectives such as waste minimisation, pollution prevention, and biodiversity and species protection are either required to be integrated with the EIA or may be done so voluntarily. Also included are risk assessment, alternatives, and cumulative impacts.	A top level environmental policy is required, including an on-going commitment to prevent pollution, which is often broadly defined. The policy does not always specifically address integration of the EMS with other laws and policies. Certification surveillance audits will look for evidence that EIA information has been incorporated into the EMS.

Impact assessment requirements	EIA processes often include detailed directions for the performing and cumulative impacts. Legal flexibility enables best practice to be incorporated, where appropriate.	An investigation of "environmental aspects" is required. However, the requirements for performing this investigation generally lack specificity regarding the scope or content. However, certification and surveillance audits will often question scope and content.
Mitigation	Mitigation measures are generally required to be identified and analysed as part of the EIA planning process.	EMS provides a system for ensuring that mitigation measures are implemented during the functioning of the project, policy or operation.
Accumulated environmental experience	Many years of experience have been accumulated in the planning and analysis of significant environmental impacts through different EIA processes worldwide.	This is a relatively new process. Only limited experience has been accumulated in the planning and analysis of significant environmental aspects. However, the speed at which the process has been spread globally has caused significant cross-pollination of the ideas and experiences.
Significance	Specific factors determining the significance of the environmental impacts are frequently specified in the EIA guidance documents or other relevant regulations.	No detailed direction for interpreting or determining the meaning of "significance" is provided. Significant impacts can be readily drawn into the impacts and aspects process.
Continual improvement	Most EIA processes lack a specific component for continually improving quality.	A continuous improvement process is a basic concept in an EMS.
Life cycle	An analysis of "reasonably foreseeable" impacts over the life cycle of the action is typically required, though in South Africa, Life Cycle Analysis (LCA) is infrequently undertaken.	Details of how to perform a life cycle analysis (LCA) are described in the ISO 14040 standard.

It has been established that, at times, EIA amounts to little more than an exercise in *pro forma* compliance with legal requirements (Ortolano and Shepherd, 1995). In a major European study across a number of countries, EMS has been shown to be similarly flawed exhibiting no statistically significant relationship between adoption of a formal EMS and improved environmental performance (Gunningham, 2007 citing Science Policy Research Unit, 2001). Such shortcomings in both these environmental management tools make the design and adoption of combined strategies of paramount importance (Gunningham, 2007).

Conclusion

The need to manage the environment in a sustainable manner has seen the emergence of EM tools, including EIA and EMS. Tensions exist in deciding whether to use regulatory or voluntary approaches in EM. Based on sound principles, regulatory EIA has emerged as the primary EM tool. However, several shortcomings have been identified within EIA as exemplified in Shell's EIA rectification process, in which it was noted that there was no provision for cumulative impact assessment amongst other shortcomings. It is therefore proposed that an integration of EMS and EIA be considered for the sustainable management of Shell's fuel tank installations.

An EMS helps overcome the weaknesses of EIA by focusing on the development of organisational structures that clearly define roles and environmental responsibilities for managing Shell's tank installations. The environmental information gathered during the EIA rectification process would thus be more effectively utilised. Shell's EIA rectification process exposed shortcomings within EIA. More importantly, the process also provided an opportunity for proposing a pragmatic solution for sustainable management of Shell's fuel storage tanks through the integration of EIA and EMS. The combination of EIA and EMS is essential for the attainment of environmental sustainability.

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